V28525

HITACHI

8mm VIDEO CAMERA/RECORDER

VM-E110E (UK)

Instruction manual

To obtain the best performance and ensure years of trouble-free use, please read this instruction manual completely.

8

PRECAUTION

■ **No water, dust or sand**
Be careful that no water, dust or sand enters the camera/recorder because it may cause trouble and accidents.

■ When you shoot at a scene which contains an extremely bright object such as the sun or a light source, a bright vertical bar may appear in the picture.
Your camera/recorder is functioning properly, but the solid-state pickup device (C.C.D) usually causes this as an inherent characteristic. Try to avoid shooting an excessive bright object directly.

■ Do not leave the viewfinder lens facing sunlight for a prolonged period, or the phosphorescent surface of the cathode ray tube may be damaged.

MOISTURE
Avoid operating your camera/recorder immediately after moving it from a cold place to a warm, humid place. Give the camera/recorder 2 to 3 hours to stabilize in the ambient conditions of the surroundings before inserting a cassette. When moved from a cold place to a warm, humid place, moisture may condense on the head drum inside the machine. This moisture could cause the tape to stick to the headwheel and damage the headwheel or tape.
When a small amount of moisture is sensed, "TAPE" flashes in the viewfinder. Remove the cassette and set the Operate switch to OFF, then wait for about one hour.

BE SURE NOT TO LEAVE IT IN A PLACE AT HIGH TEMPERATURE EXCEEDING 60°C, OR ITS INTERNAL PARTS MAY DETERIORATE. BE CAREFUL NOT TO LEAVE THE UNIT IN THE FOLLOWING PLACES:
* **Inside a car with the window closed and in direct sunshine.**
* **Near heating appliances.**
* **In direct sunshine in summer.**

NOTES:
- This unit uses 8mm video format cassettes.
- It records and plays back in the SP mode (20.05 mm/sec.).

This product is manufactured to comply with the radio interference requirements of EEC Directive 89/336/EEC.

WARNING : It is permissible to record television programmes only in the event that third party copyrights and other rights are not violated.

WARNING : To prevent risk of injury or damage to your camera/recorder and the AC adapter/charger, use only the specified batteries and AC adapter/charger.
Batteries; VM-BP82G, VM-BP82 and VM-BP84 (The VM-BP82 is supplied with this camera/recorder.
AC adapter/charger; VM-AC84E(UK)

Important for United Kingdom
The mains lead on this equipment is supplied with a moulded plug incorporating a fuse, the value of which is indicated on the pin face of the plug. Should the fuse need to be replaced, an ASTA or BSI approved BS 1362 fuse must be used of the same rating. If the fuse cover is detachable never use the plug with the cover omitted. If a replacement fuse cover is required, ensure it is of the same colour as that visible on the pin face of the plug. Fuse covers are available from your dealer.
DO NOT cut off the mains plug from this equipment. If the plug fitted is not suitable for the power points in your home or the cable is too short to reach a power point, then obtain an appropriate safety approved extension lead or consult your dealer.
If there is no alternative to cutting off the mains plug, ensure that you dispose of it immediately, having first removed the fuse, to avoid a possible shock hazard by inadvertent connection to the mains supply.

IMPORTANT
The wires in the mains lead are colored in accordance with the following code:

Blue = Neutral, Brown = Live

As these colours may not correspond with the colored markings identifying the terminals in your plug, proceed as follows:
The wire coloured BLUE must be connected to the terminal marked with the letter N or coloured BLUE or BLACK. The wire coloured BROWN must be connected to the terminal marked with the letter L or coloured BROWN or RED.
On no account connect either of these wires to the terminal marked E or by the earth symbol ⏚ or coloured green or green and yellow.

FEATURES

Single-Unit Convenience and Ease of Operation
Your video camera/recorder combines the functions of a video camera and a video tape recorder in one lightweight, easy-to-use instrument. This eliminates interconnecting cables and simplifies operation.

Record and Playback Capability

Record — Your camera/recorder can record directly from the built-in video camera.

Playback — Video/audio played back by the video recorder or fed directly from the camera may be viewed and heard on a TV receiver/monitor by using the audio/video cable.

Auto Focus Power Zoom Lens
The 12X autofocus zoom lens uses video auto focus system to automatically maintain focus and to allow you to zoom in and out for tele or wide angle shots at just the touch of the zoom button.

Wireless Remote Control is provided

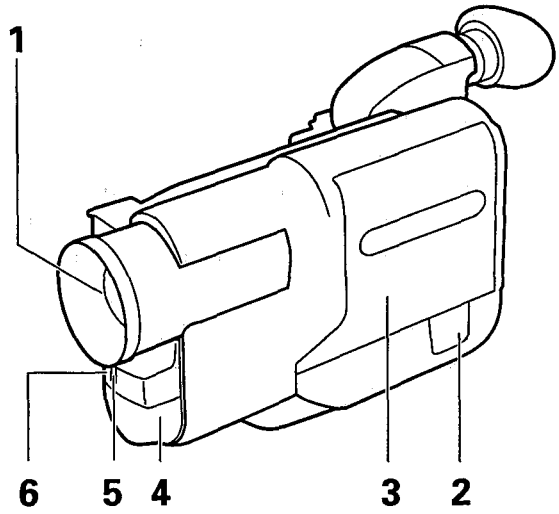
Automatic Title Recording
This function automatically records the created title on the tape together with the date for about 10 seconds after recording is started.

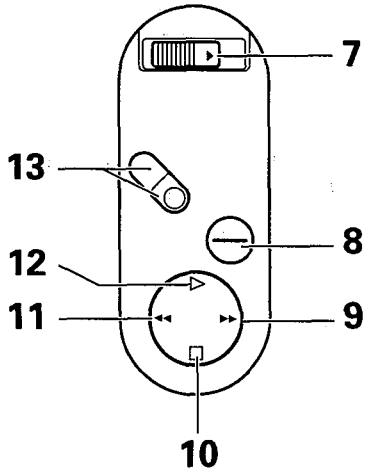
Date Search
This function memorizes the start and end positions of recordings you made on a specific day so you can easily locate those positions later as long as the cassette is left in the camera/recorder.

Programme AE (Auto Exposure)
The camera automatically determines the shutter speed and aperture according to the brightness of the subject.

TABLE OF CONTENTS

Controls and functions 3
Accessories 6
Electronic viewfinder position adjustment 7
Eyepiece adjustment 7
Attaching the tele or wide converter 8
Programme AE 8
Flying erase head 8
Loading the lithium batteries 9
Power sources 10
Checking the battery pack 13
Charging the battery 14
Insertion and removal of cassettes 15
Camera recording 16
Date/time setting 17
Automatic date recording 18
Automatic title recording 18
Auto focus 19
Power zoom 20
Instant zoom 21
Remaining tape 21
Title recording 21
Instant review 23
Macro 23
Display button 23
Linear time counter 24
Memory 24
Date search 25
Wireless remote control 26
Audio/video dubbing 27
Connections and operations for viewing the picture played back on your TV 28
Video channel setting 29
F-search and R-search 30
Still 30
Quick edit 30
Camera/recorder to VCR dubbing 31
Synchro edit 32
Attaching the optional DC camera light 33
Troubleshooting 34
Maintenance 36
Specifications 36
Optional accessories 37





1. Lens
F1.6 (4 ~ 48 mm) 12X power zoom lens features with auto focus and auto iris functions.

2. Cassette Holder Close Button
CAUTION: Be sure to press this button to close the cassette holder. Otherwise, the tape may become slack and may be damaged.

3. Cassette Holder
Slide EJECT switch to open the cassette holder. Be aware of the cassette direction when inserting.
NOTE: Power source must be connected to open the cassette holder.

4. Microphone

5. Record Indicator
This indicator lights up to indicate that the camera/recorder is recording.

6. Infrared Ray Receiving Section
Receives infrared rays from the remote control unit.

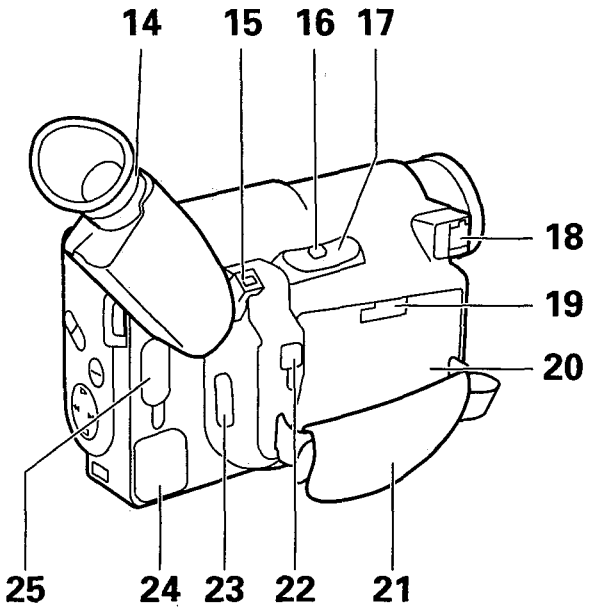
7. EJECT Switch
Operates with Operate switch either on or off, if a power source is connected to the camera/recorder.

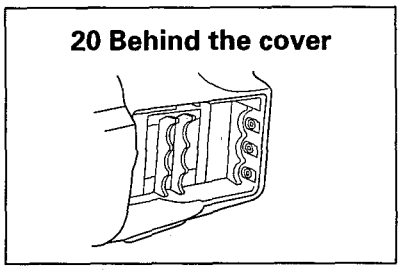
8. DATE/TITLE (DISPLAY) Button
Use this button to record the date, time and title on your tape. Any time that the date, time and title displays appear in the viewfinder, they are recorded on your tape. This button can be used instead of DISPLAY button on the remote control in the recorder mode.

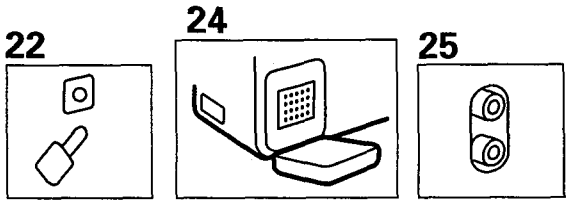
9. F.F Button
Press this button during stop or rewind mode, and fast-forwarding starts. Press the button during playback of tape, and the tape is played back in the forward direction approximately 7 times faster than the normal speed to confirm the recorded content. Press PLAY button to return to normal playback mode or press STOP button to stop tape movement. Also use F.F button when setting the date/time.
NOTE: You can also visually scan forward when the camera/recorder is in record/pause (stand-by) mode by pressing and holding this button.

10. STOP Button
The STOP button is used to stop playback, rewind, and fast forward operations. The STOP button has no effect during record operation. Also use STOP button when setting the date/time.

11. REW Button
Press this button during stop or fast forward mode, and fast-rewinding starts. Press the button during playback of tape, and the tape is played back in the rewind direction approximately 5 times faster than the normal speed to confirm the recorded contents. Press PLAY button to return to normal playback mode or press STOP button to stop tape movement. Also use this button to review the last few seconds of the tape you are recording. Use REW button when setting the date/time.
NOTE: You can also visually scan backward when the camera/recorder is in record/pause (stand-by) mode by pressing and holding this button.







(Behind the jack covers)

12. PLAY Button
Used for playback of tape.
NOTE: When the camera/recorder is in record/pause (stand-by) mode, pressing and holding this button will play the tape at normal.

13. FOCUS Control Buttons
Press these buttons simultaneously to switch between automatic and manual focusing. When "FOCUS" is not displayed in the viewfinder, focusing is automatic.
If these buttons are pressed at the same time and "FOCUS" appears, the camera/recorder enters the manual focus mode. For manual focusing, press the F or N button to bring the subject into focus.

14. Diopter Control
To use the electronic viewfinder, turn this control for your optimum focus adjustment.

15. Operate Switch
This turns the camera/recorder on and off and also switches between the camera and recorder modes. Set the switch to "CAM" to turn the camera's power on and to "VIDEO" to turn the recorder's power on. Press and hold the small red button in the switch to switch it.

16. INST. ZOOM (Instant Zoom) Button
Use this button to magnify the image being recorded 1.5 times momentarily.

17. Power Zoom Switch
This switch performs zooming electrically.
"W": Picture becomes wider gradually.
"T": Picture becomes telescopic gradually.

18. Camera Light Shoe
Used to attach the camera light.

19. OPEN Lever
Use this to open or close the cover of the power supply attachment section.

20. Power Supply Attachment Section (Behind the cover)
Attach the battery pack (provided) or alkaline batteries here.

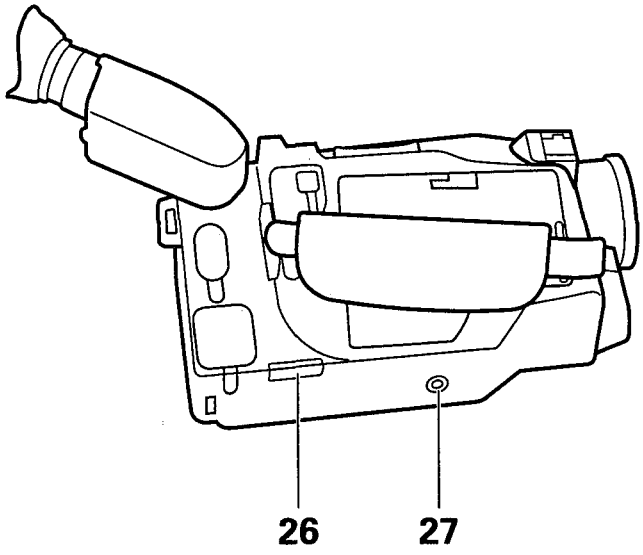
21. Hand Strap
Adjust to best fit to your hand. (Refer to page 5)

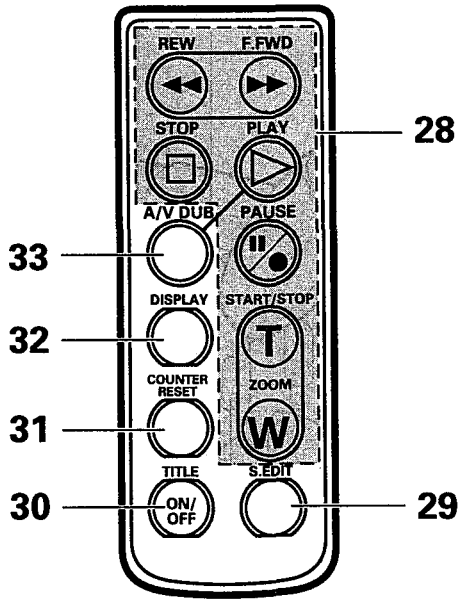
22. DC IN Jack (Behind the jack cover)
When using the AC adapter/charger, connect one end of the DC cord (provided) to this jack and the other end to the DC OUTPUT jack of the AC adapter/charger. When using the car battery cord (optional), connect this jack and the DC OUTPUT jack of the car battery cord.

23. Start/Stop Button
This button is used to control the camera/recorder.
When this button is pressed with the camera/recorder set to the record/pause mode, the tape runs to start recording.
When this button is pressed again, the tape stops and the camera/recorder enters the record/pause (stand-by) mode. This button may also be used to display a still picture during playback mode.

24. AV OUT Jack (Behind the cover)
Use the RF output adapter (optional) to connect this jack to a TV to view the pictures played back by the camera/recorder.

25. AV OUT Jacks (Behind the cover)
You can use an audio/video cable (provided) to connect this jack to a TV when viewing the playback picture on the TV, etc.





26. Clock Battery Compartment
Pull the battery holder and install the lithium battery (provided).

27. Tripod Mount Screw
Use this screw to mount the camera/recorder on a tripod (generally available).

28. Camera/Recorder Control Buttons
These shaded buttons on the remote control function the same as those on the camera/recorder.

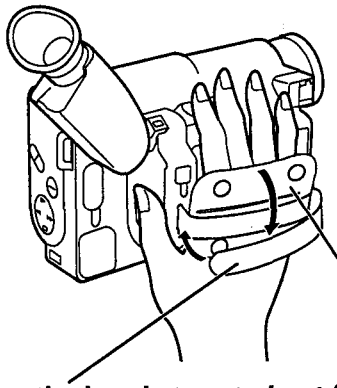
29. S. EDIT (Synchro Edit) Button (only on the remote control)
Use this button to activate the synchro edit function for dubbing.

30. TITLE ON/OFF Button (only on the remote control)
Use this button to store a title in memory or recall the stored title and record it superimposed on the picture being shot.

31. COUNTER RESET Button (only on the remote control)
Press this button to reset the linear time counter in the viewfinder to "0:00:00".

32. DISPLAY Button
Use this button to select the display in the viewfinder.
This button can be used instead of the DATE/TITLE button on the camera/recorder in the recorder mode.

33. A/V DUB Button (only on the remote control)
This button is used to record new audio and video in place of existing audio and video.

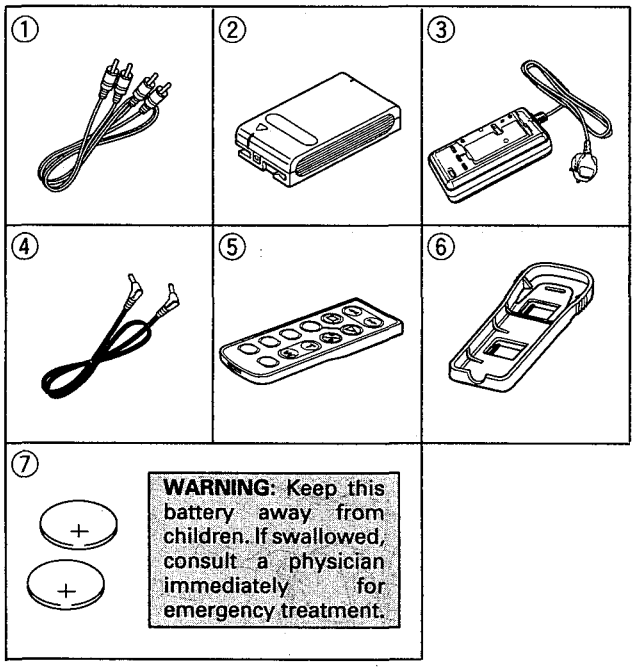


Adjust the hand strap to best fit to your hand.

ACCESSORIES

Check to make sure you have the following components and accessories (besides the camera/recorder unit itself) before disposing of the packing material.

1. Audio/Video Cable
2. Battery Pack
3. AC Adapter/Charger
4. DC Cord
5. Remote Control
6. Remote Control Holder
7. Batteries for Date/Time and Remote Control (CR2025)



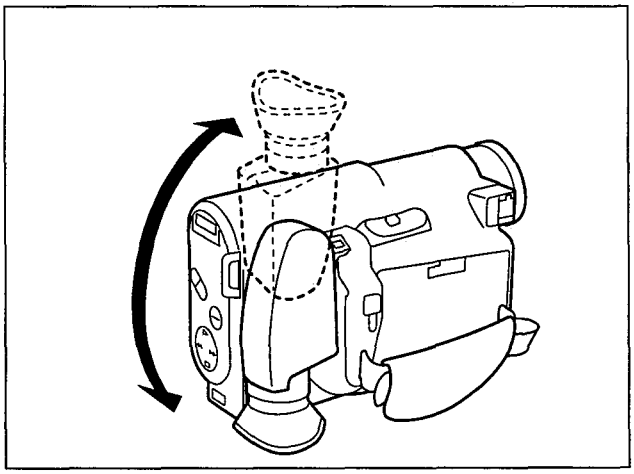
ELECTRONIC VIEWFINDER POSITION ADJUSTMENT

Adjust the electronic viewfinder to a position where you can see through it easily.

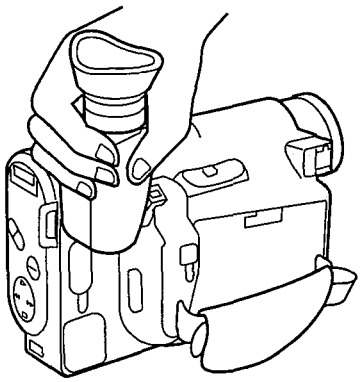
NOTES:

- Put the viewfinder back to original position when storing the camera/recorder into the carrying case or carrying the camera/recorder.

- Do not point the electronic viewfinder to direct sunlight; it could damage the viewfinder.

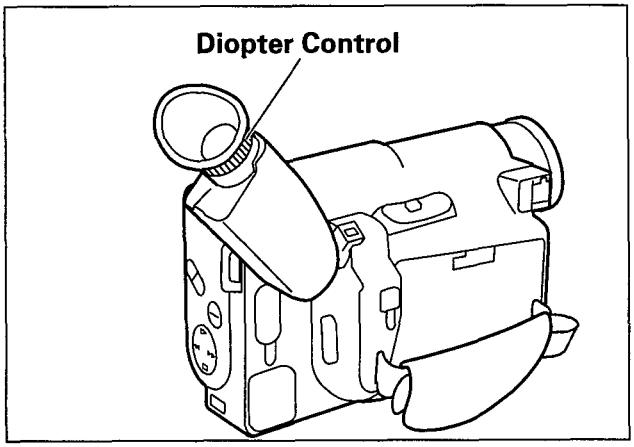


CAUTION:
Do not hold the unit by the electronic viewfinder when carrying as this could cause a malfunction.



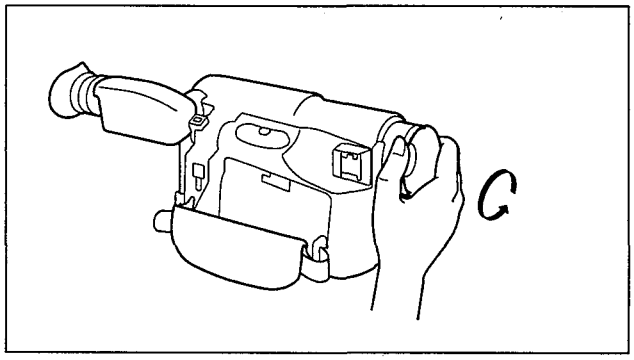
EYEPIECE ADJUSTMENT

To use the electronic viewfinder, adjust the diopter control for optimum focus adjustment.

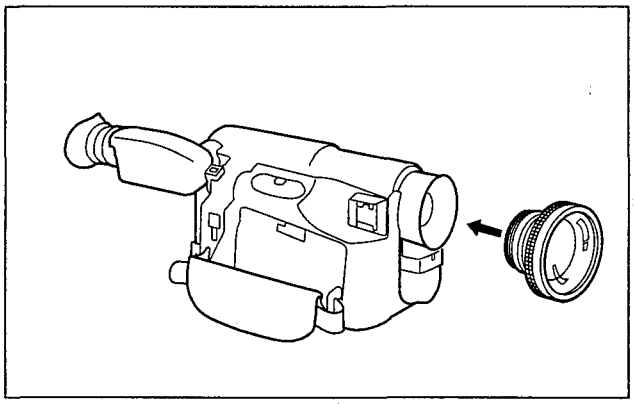


ATTACHING THE TELE OR WIDE CONVERTER

1. To remove lens hood, turn it counterclockwise.



2. Remove both caps of the tele or wide converter.
3. Screw the lens into the threads on the front of video camera/recorder lens assembly.



PROGRAMME AE (Auto Exposure)

Programme AE automatically selects the shutter speed 1/50, 1/100, 1/150, 1/250, 1/350, 1/500, 1/750, 1/1000, 1/1500, 1/2000 or 1/4000 second that is optimum for the brightness of the subject. The iris is also adjusted automatically in response to the shutter speed.

FLYING ERASE HEAD

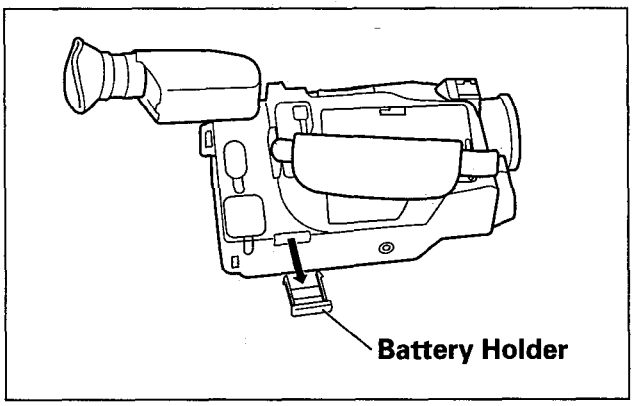
A rotating erase head which eliminates glitches and rainbow noise that occurs at the joints between recordings in previous models.

LOADING THE LITHIUM BATTERIES

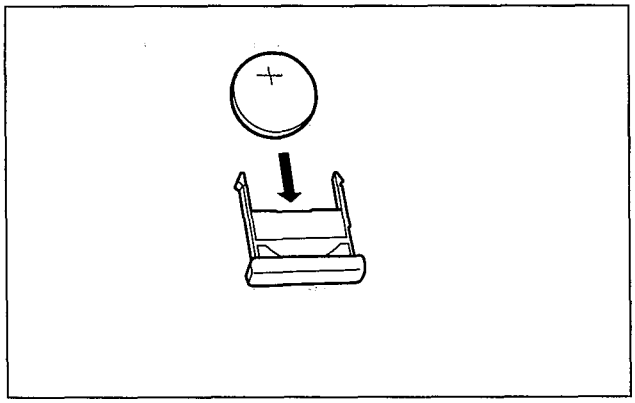
You may want to install the lithium batteries (provided) immediately to prevent losing them.

■ Clock battery

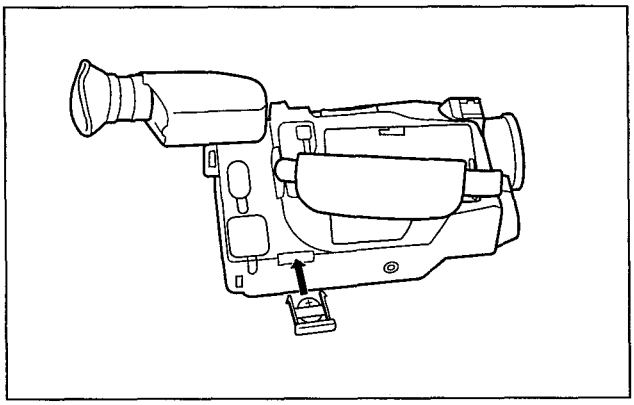
1. Pull out the battery holder.



2. Insert the battery with the "+" terminal facing up.

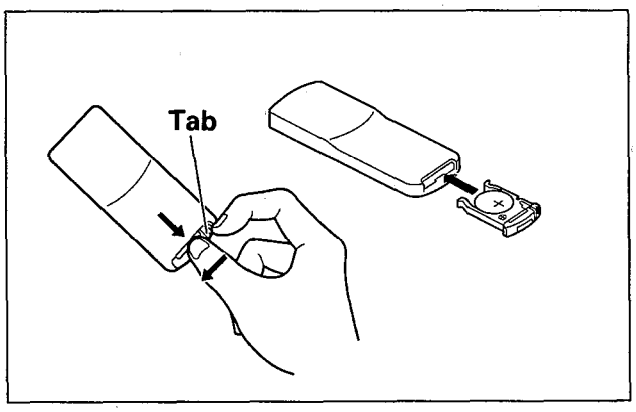


3. Fully insert the battery holder into the camera/recorder.



■ Remote control battery

1. Push the tab to the left and hold it, then pull out the battery holder.



2. Insert the battery with the "+" terminal facing up as shown in the figure.
3. Replace the battery holder with battery in the remote control making sure that it is full inserted.

NOTE: When replacing the batteries, use 3V micro lithium battery CR2025.

This product uses the lithium batteries which contains dangerous chemicals. Handle and dispose of with great care.

WARNING

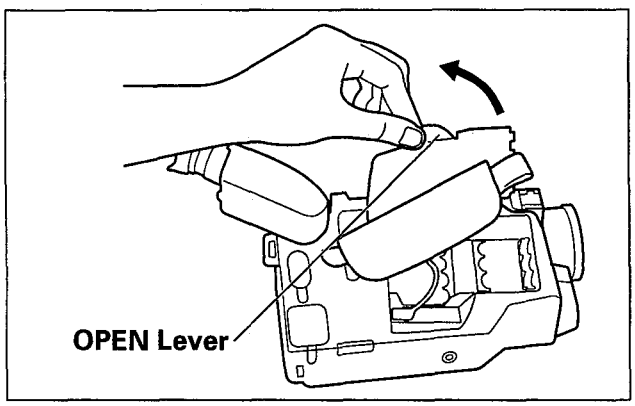
- Keep the batteries away from children and pets. If swallowed consult a physician immediately for emergency treatment.
- Keep the batteries in a dark, cool, dry place.
- Do not throw the batteries in a fire.
- Do not short circuit the batteries.
- Do not disassemble the batteries.
- Do not hold the batteries with the metallic tweezers.
- Do not re-charge the batteries.
- Wipe the batteries with dry cloth and set properly confirming ends(+,-).
- For disposal place in a plastic bag and put in waste bin.

NOTE: Be sure to turn off power of the camera/recorder when attaching or detaching a power supply (battery, AC adapter/charger, etc.) to the camera/recorder.

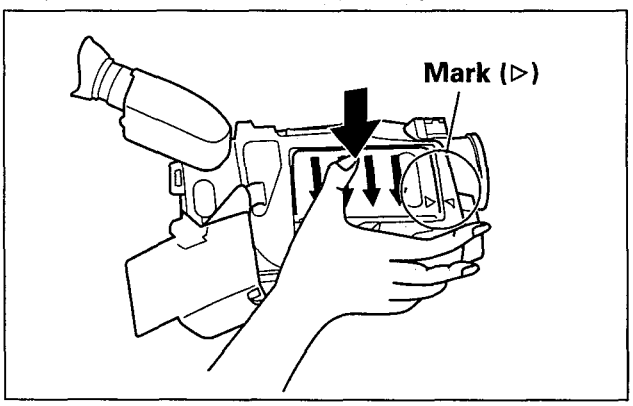
■ WHEN USING WITH THE BATTERY (provided)

NOTE: The battery must be charged before it can be used for the first time. Refer to "CHARGING THE BATTERY" on page 14.

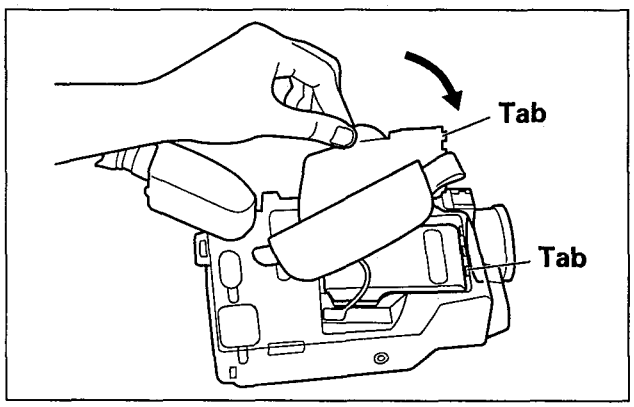
1. Lift the OPEN lever and pull it up. The power supply attachment cover will open.



2. Insert the battery into the attachment section aligning it with "◁" mark on the camera/recorder.
3. Press the centre of the battery and hold it, then slide it in the direction of the arrow.

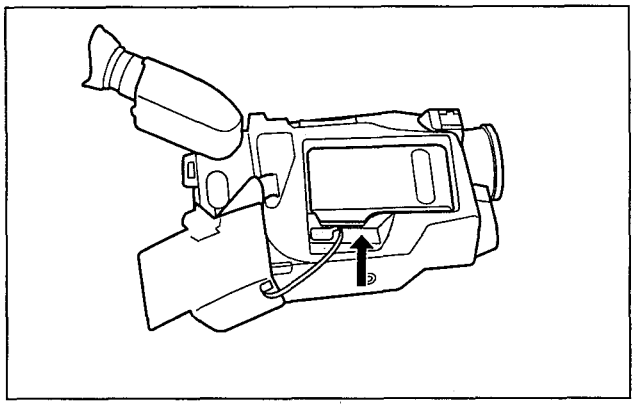


4. After installing the battery, close the cover. Hold the OPEN lever and align the tabs on both sides of the cover with the end of the attachment section.

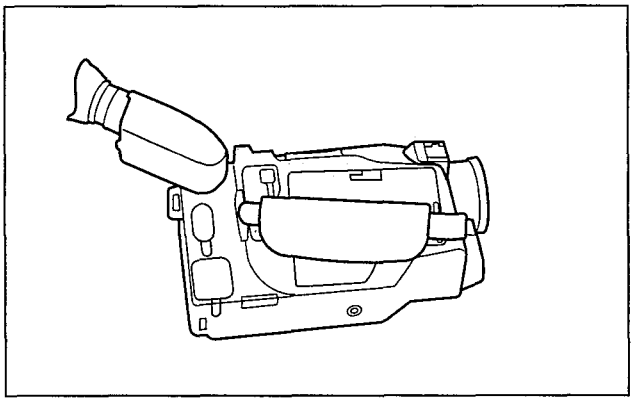


■ To remove the battery

1. Lift the OPEN lever and pull it up. The power supply attachment cover will open.
2. Push the side of the battery in the direction of the arrow. A click will be heard and the battery is released.



3. Remove the battery and close the cover.



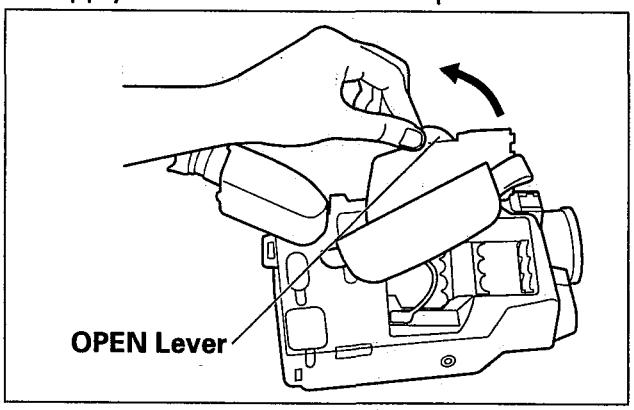
NOTES:

- If the OPEN lever is flat, the cover will not close.
- Always remove the battery from the camera/recorder after use.
- We cannot guarantee that the camera/recorder will not malfunction if you use battery packs other than those specified.

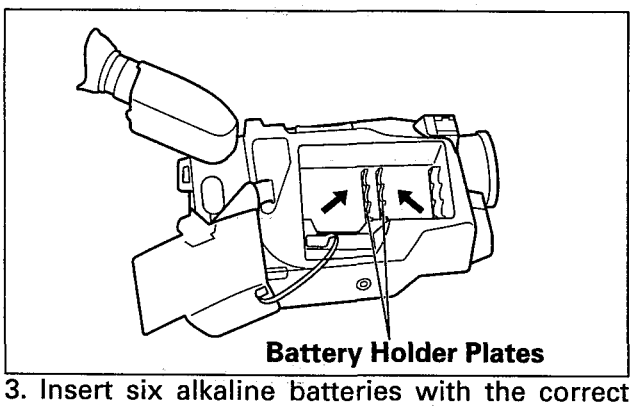
■ WHEN USING WITH ALKALINE DRY-CELL BATTERIES

The camera/recorder can be powered by six alkaline dry-cell batteries inserted into the power supply attachment section. The continuous operation time of the camera/recorder depends on the type of alkaline batteries used.

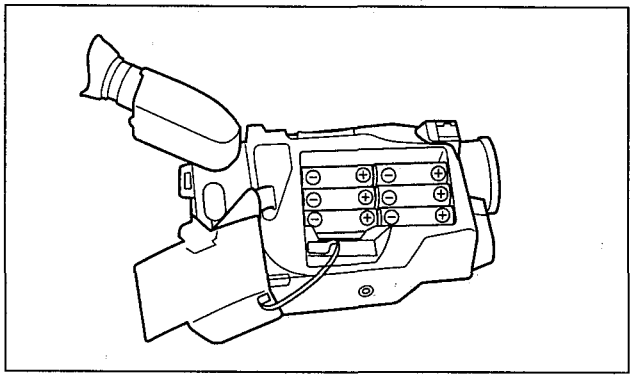
1. Lift the OPEN lever and pull it up. The power supply attachment cover will open.



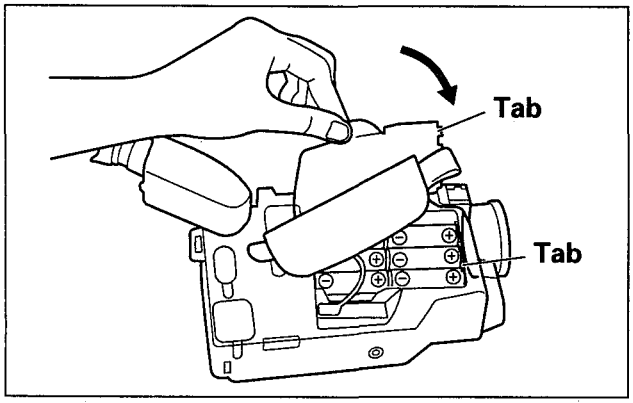
2. Lift the battery holder plates at the centre of the attachment section.



3. Insert six alkaline batteries with the correct polarities.



4. After installing the batteries, close the cover. Hold the OPEN lever and align the tabs on both sides of the cover with the end of the attachment section.



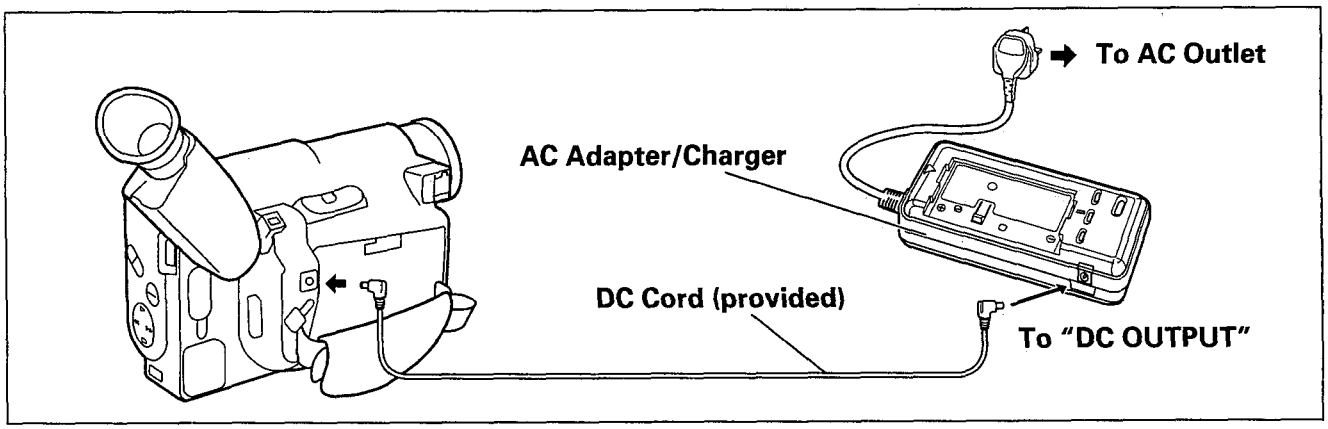
NOTES:

- Use only "IEC R6" alkaline batteries marked "LR6" (Manganese batteries cannot be used to power the camera/recorder.)
- It is recommended that you use alkaline batteries within the recommended period of use or within two years of the date of manufacture.
- Be careful of the following to prevent the leakage of liquid or an explosion.
  - Check that the orientation (polarity) of the batteries is correct.
  - Remove the batteries when not using the camera/recorder.
  - Remove the used batteries from the camera/recorder.
  - Do not use batteries made by different manufacturers at the same time.
  - Do not use old and new batteries at the same time.
- If the liquid leaks, remove the batteries immediately and ask your nearest dealer to inspect the camera/recorder (this will be at your own expense).
- Do not let the batteries or the terminals of the camera/recorder get dirty. If they are dirty, use a dry cloth to wipe off the dirt completely.
- It is recommended that you use a battery pack to power the camera/recorder when using a DC camera light. If a camera light is used when the camera/recorder is powered by batteries, the required supply voltage will be very short and the camera/recorder will turn off soon.
- When the batteries are used to power the camera/recorder in a cold place, it may not operate normally; the operation time may become extremely short or the camera/recorder may not be turned on. It is recommended that you use a battery pack to power the camera/recorder in a cold place. (At 10°C, the chemical reaction decreases the capacity of battery to one tenth when compared to that at normal temperature 20°C.)
- Since the supply voltage from batteries decreases more abruptly when compared to that from a battery pack, the battery remaining level indicator ( ) may not flash in the viewfinder, noise may occur, the picture and sound may not be recorded normally and/or the power may be turned off soon. These phenomena occur because the capacity of batteries becomes low. So turn the power switch off and replace the batteries. If the power switch is left turned on in this state, the power may turn on temporarily and turn off again repeatedly.

- Noise may appear momentarily in the viewfinder when recording is started or stopped.
- Be careful when touching the batteries with your bare hand to remove them as they are warm during and just after use.

CAUTION: Be sure not to short, disassemble, heat or throw batteries into fire. This is very dangerous.

■ WHEN USING WITH THE AC ADAPTER/CHARGER (provided)



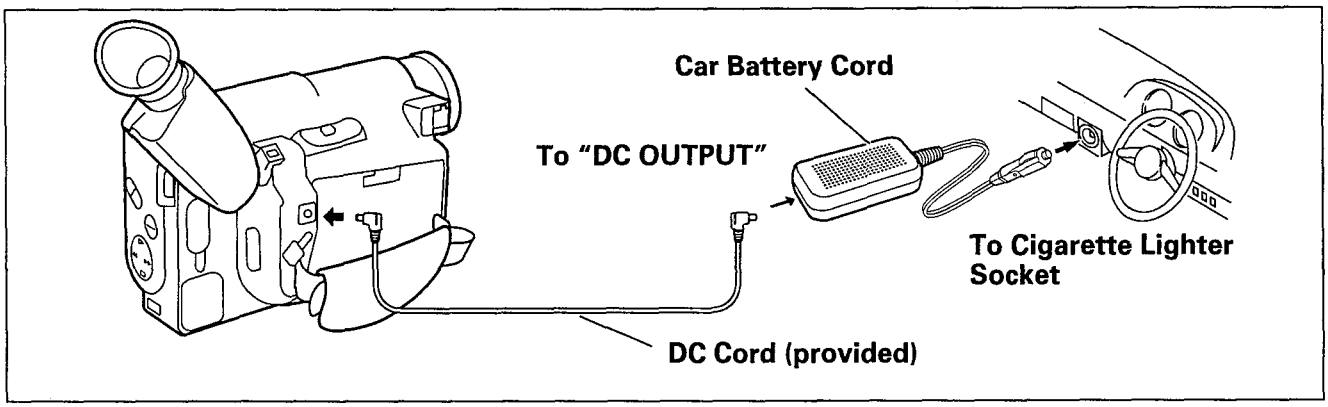
1. Connect one end of the DC cord (provided) to the camera/recorder as shown in the figure.
2. Connect the other end of the DC cord to the DC OUTPUT jack of the AC adapter/charger.
3. Plug the AC adapter/charger power cord into an AC electrical outlet; the POWER indicator on the AC adapter/charger will come on.

See the bottom of the AC adapter/charger. The rating label is located on the bottom of the AC adapter/charger.

NOTES:

- This AC adapter/charger is universal for use with AC 110 — 240V around the world. If you use the camera/recorder in some foreign countries, an AC plug adapter (Not supplied) may be necessary.
- When using the AC adapter/charger to power the camera/recorder, the battery level indicator may display " ▭ ". This indicator is used for battery operation and has no meaning when using the AC adapter/charger to power the camera/recorder.
- The AC adapter/charger cannot charge the battery and operate the camera/recorder at the same time.
  Remove the battery from the AC adapter/charger to supply power to the camera/recorder.

■ WHEN USING WITH THE CAR BATTERY (By using optional car battery cord)



1. Connect one end of the DC cord (provided) to the camera/recorder, as illustrated.
2. Connect the other end of the DC cord to DC OUTPUT of the car battery cord.
3. Connect the car battery cord to the car's cigarette lighter socket.

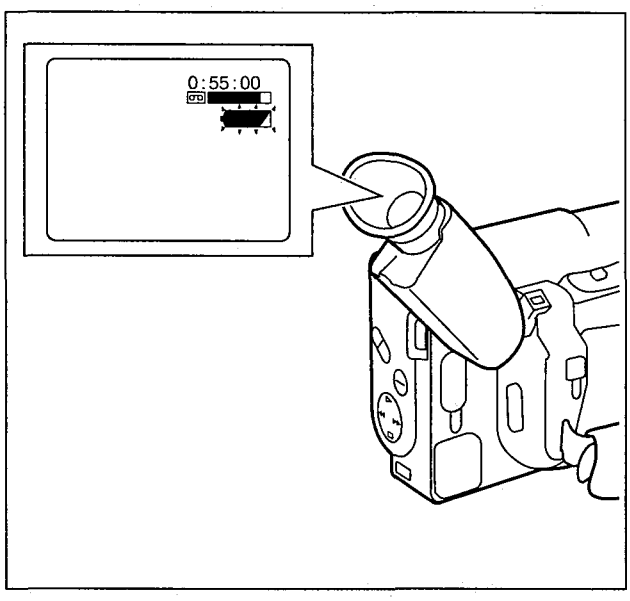
NOTES:

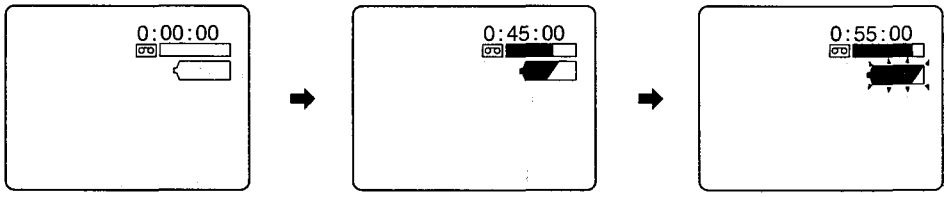
- The car battery cord is designed to be used only with automobiles having a 12/24-volt negative ground system.
- To prevent fire or shock hazard or damage to your camera/recorder, please use only the specified car battery cord.

CHECKING THE BATTERY PACK

When the " ▬ " indication appears in the viewfinder and flashes while the camera/recorder is operated with a battery pack (provided) or alkaline batteries, it indicates that the battery is insufficiently charged. Charge the battery pack or replace it with a charged battery pack or replace the alkaline batteries.

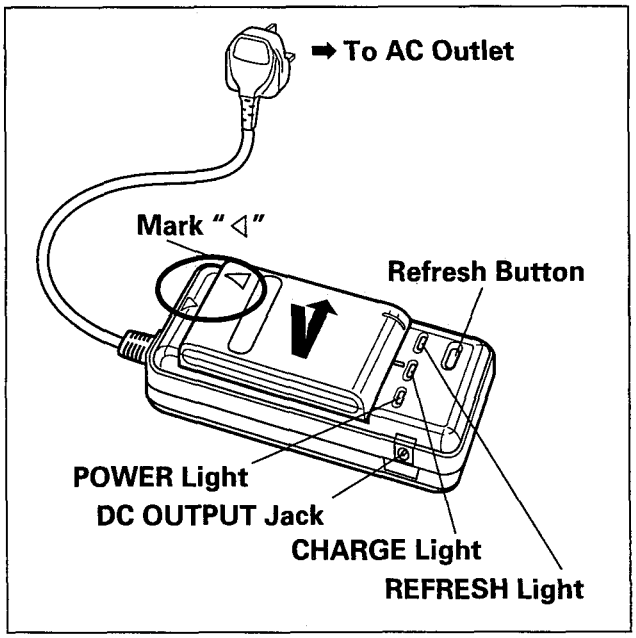
NOTE: When the camera/recorder is turned on, the battery level indicator " ▭ " is displayed in the viewfinder indicating the condition of camera/recording battery. When the battery is fully charged, " ▭ " is displayed.
After several minutes, the symbol will change to " ▬ ". When the battery is very near empty, the symbol will change to " ▬ " and start blinking. You should find an alternative power source or recharge the battery pack or replace the alkaline batteries before continuing to use your camera/recorder.





CHARGING THE BATTERY

1. Plug the AC adapter/charger power cord into AC electrical outlet.
2. Attach the battery to the AC adapter/charger. Align the "◁" mark on the battery with that of AC adapter/charger and push the battery flush with the AC adapter/charger and slide it in the direction of arrow as shown in the figure.
   NOTE: You must remove the DC cord from the AC adapter/charger to charge the battery. If the DC cord is connected, CHARGE light will flash.
3. The CHARGE light will be lit while the battery is accepting a charge, and will go out when the battery is fully charged.
   NOTE: If you repeatedly charge a battery which is not completely discharged or leave a battery unused for a long time, the operation time of the battery will become shorter even when it is completely charged. In this event it is recommended that you refresh the battery before charging it.
   Attach the battery and then press the refresh button to refresh it. When refreshing is complete, the CHARGE indicator will light in place of the REFRESH indicator and charging will start automatically.

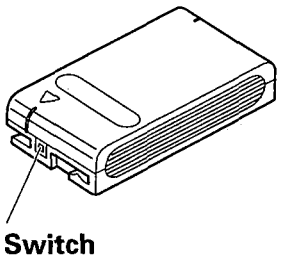


To prolong the life of Ni-Cd batteries

- Only re-charge batteries when they have completely discharged and the warning light ( ) is flashing.
- DO NOT top-up charge on batteries.

NOTES:

1. The time required for charging the battery (provided) is approx. one hour.
2. When fully charged, the battery should supply approx. 65 minutes of operating time (depending on how much you use zoom and pause).
3. It takes about 4 hours to refresh a fully charged battery (provided).
4. Charge the battery before use and store it at normal room temperature.
5. The battery should be charged at a temperature of 10°C~30°C to prevent damage.
6. Do not operate the battery at temperatures below –10°C or above 35°C. The battery may be damaged if operated at temperatures above 50°C. Operation time will decrease at extremely low temperatures.
7. After repeated chargings and use, the operation time will gradually decrease. When operation time becomes too short to be useful, it is time to replace the battery.
8. If the POWER light on the AC adapter/charger starts flashing, remove the battery and then reattach it. If after several attempts the POWER light continues to flash, this means your battery cannot take a charge and must be replaced with a new one.
   The POWER light will also flash if a hot battery is attached to the AC adapter/charger.
   Attaching an extremely hot battery to the AC adapter/charger is not recommended; it should be allowed to cool down before being attached.
9. Do not short the battery's terminal.
10. Do not attempt to disassemble or modify the battery. There are no user serviceable parts inside.
11. Throwing the battery into a fire or exposing the battery to excessive heat — over 65°C could be hazardous.
12. Set the mark switch of any battery which has already been charged to red as shown in the figure. This lets you discriminate between charged and uncharged batteries easily .
    NOTE: The mark switch is not concerned with the battery's performance.

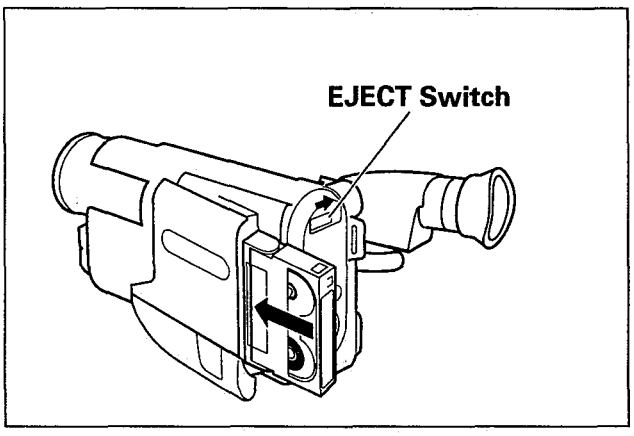


INSERTION AND REMOVAL OF CASSETTES

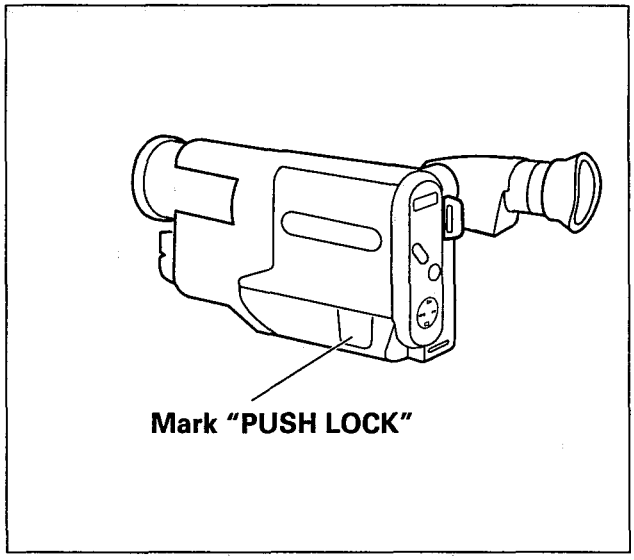
Before inserting or removing a cassette, be sure to connect the power source. When a power source is connected, the cassette can be ejected and removed whether the power is on or off.

■ **Insertion**

1. Slide the EJECT switch.
   The cassette door will open.
2. Insert a cassette so the transparent window is toward you and the arrow toward the cassette holder. Slide the cassette into cassette holder as far as it will go.



3. Press the cassette holder.
   Press the section of the holder marked "PUSH LOCK" until a click is heard.
   Be sure that you push the cassette holder marked "PUSH LOCK" to close the holder. Otherwise, the holder will not close and the tape may become slack which could lead to damage.



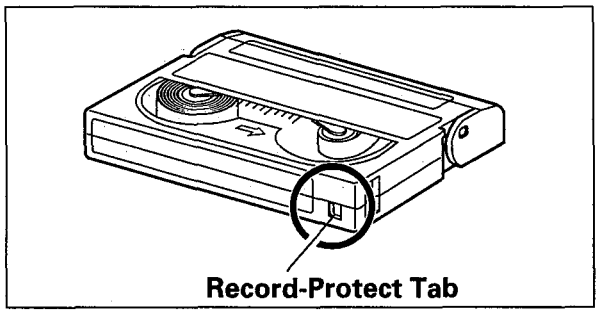
NOTE: If "TAPE" flashes in the viewfinder, remove the cassette and check that the tape is not damaged, is not slack or no dust adheres to it, etc. After making sure that there is no abnormality, reinsert the cassette. If "TAPE" reappears, see "TROUBLESHOOTING" on page 34.

■ **Removal**

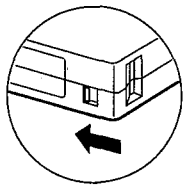
Slide the EJECT switch and remove the cassette.

8 mm Video Cassette

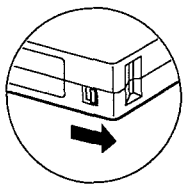
An 8 mm Video Cassette has a record-protect tab on the side of the cassette that can be slid to prevent accidental erasure of recorded material.



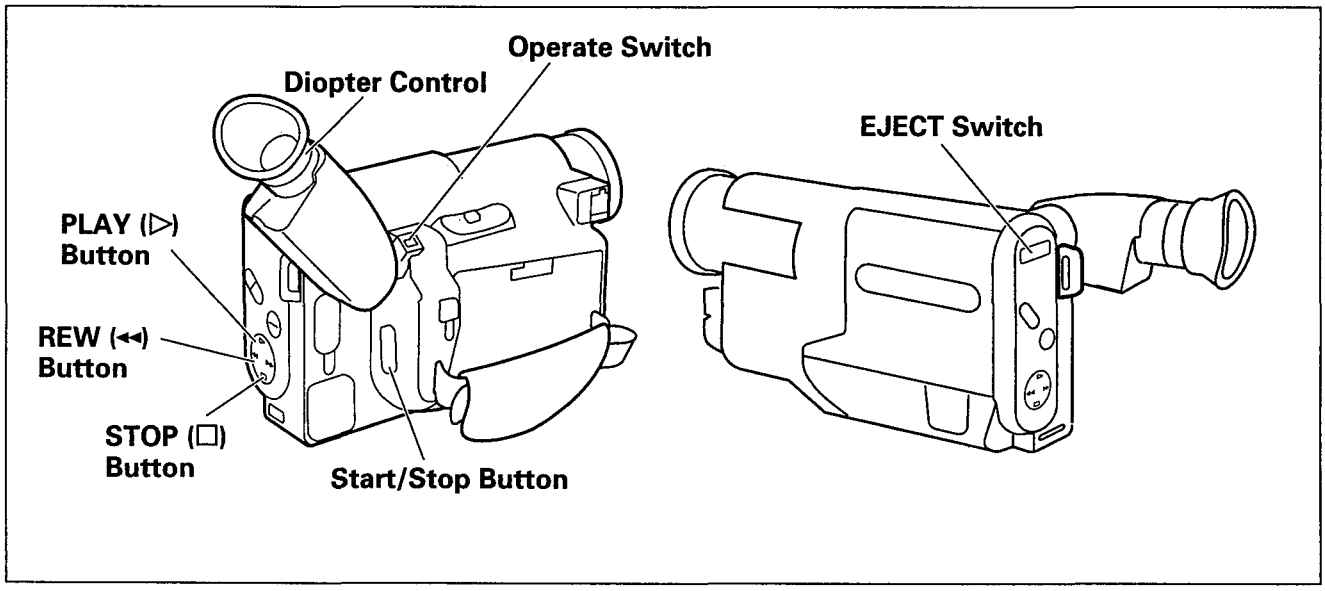
To prevent accidental erasure, slide the record-protect tab in the direction of the arrow until the tab is completely visible.



To record on the cassette again, slide the record-protect tab in the direction of the arrow. The tab will disappear behind the cassette case.



NOTE: After unpacking, it is recommended to fast forward tape to its middle and then rewind it before recording with the camera for the first time.



1. Connect either one of the "POWER SOURCES" on pages 10 through 12.
2. Slide EJECT switch and insert the cassette.

   NOTE: If the power source is not connected to camera/recorder, the cassette holder will not open.
3. Press the cassette holder. The holder will latch in the operating position.
4. Slide Operate switch to "CAM". "II" appears and the camera/recorder will enter record/pause mode automatically.

   NOTE: If the record-protect tab on the cassette is closed, the "TAPE" indication in the viewfinder flashes for several seconds and the camera/recorder will not enter record/pause mode.
5. Adjust the diopter control so the display in the viewfinder can be seen most clearly.
6. Now, press Start/Stop button to start shooting the picture. You are now recording the picture you see through the viewfinder. The "REC" indication appears in the viewfinder instead of "II".
7. Press Start/Stop button to stop recording. Press the button again to resume recording. The "II" indication appears in the viewfinder instead of "REC" in the record/pause (stand-by) mode.

   NOTES:
   - The "TAPE END" indication in the viewfinder starts flashing when there is about three minutes recording time left on the cassette.

   - If the record/pause mode continues for more than 5 minutes, the camera/recorder's power is automatically turned off. To turn on again, press Start/Stop button. The camera/recorder enters record/pause (stand-by) mode.
8. After recording, slide Operate switch to "VIDEO", and the camera/recorder will be now in the stop mode.
9. Press REW button. The tape will be rewound to the beginning.
10. Press PLAY button. The picture you just recorded will be seen through the viewfinder.

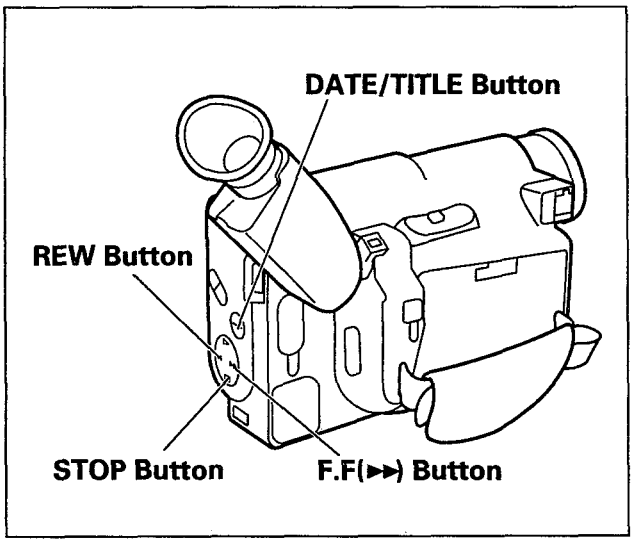
    NOTE: If you connect the camera/recorder to your TV, you can see the picture played back on your TV. Refer to "CONNECTIONS AND OPERATIONS FOR VIEWING THE PICTURE PLAYED BACK ON YOUR TV" on page 28.
11. After playing, press STOP button.
12. Slide Operate switch to "OFF" and then slide EJECT switch to remove cassette.
13. Always remove the power source from the camera/recorder after use.

NOTE: If you have a cassette tape that has already been partially recorded on and you want to record the remaining blank section, see "QUICK EDIT" on page 30.

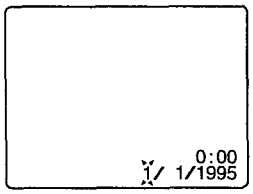
DATE/TIME SETTING

The date and time can be recorded on your tapes to act as a handy reference when viewing them at a later time. Use the following procedure to set up this display for the current date and time.
Make sure that the current time is displayed correctly before you start recording.

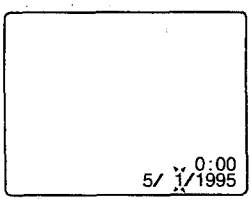
NOTE: Be sure to insert the clock battery before setting the date and time. Although the date and time can be set without the clock battery inserted, they will disappear when the battery providing power to the camera/recorder is removed.



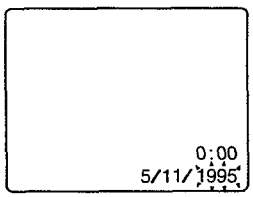
1. Slide the Operate switch to "CAM" while holding the small red button in the Operate switch down.
2. Press DATE/TITLE button.
   "0:00" and "1/1/1995" appears in the viewfinder and "1" flashes.



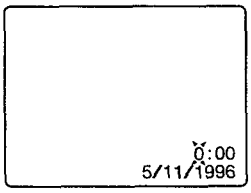
3. Press F.F button to select correct date. Hold button down to advance rapidly. If you go past the date you want to set, press REW button. When the correct date appears, press STOP button.



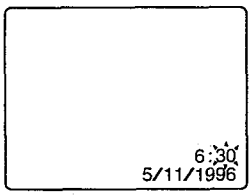
4. Press F.F button to select correct month.
   Hold button down to advance rapidly. If you go past the month you want to set, press REW button. When the correct month appears, press STOP button.



5. Press F.F or REW button to select year, and then press STOP button.



6. Press F.F or REW button to select correct hour, and then press STOP button.
7. Press F.F or REW button to select correct minute.



8. After setting to the correct minute, press DATE/TITLE button to change the display and start the internal clock.
   It is recommended that you press DATE/TITLE button to match the time signal.

■ To correct date/time after starting the date/time

1. Press and hold DATE/TITLE button, and then press STOP button. The date starts flashing.
2. Correct the incorrect digit by using F.F, REW and STOP buttons.

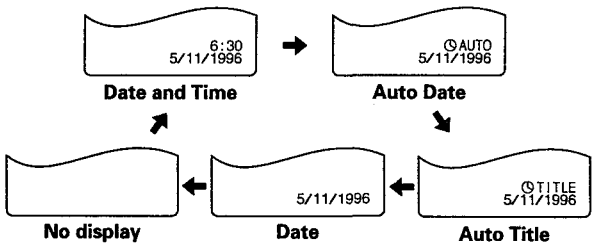
■ To correct date/time during programming

1. Press STOP button repeatedly until the digit that is incorrect flashes.
2. Correct the incorrect digit by using F.F, REW and STOP buttons.

■ **To record date/time graphics**

Press DATE/TITLE button repeatedly to select the required date/time graphics in the viewfinder, then start recording.

- The display changes in the following order each time DATE/TITLE button is pressed.



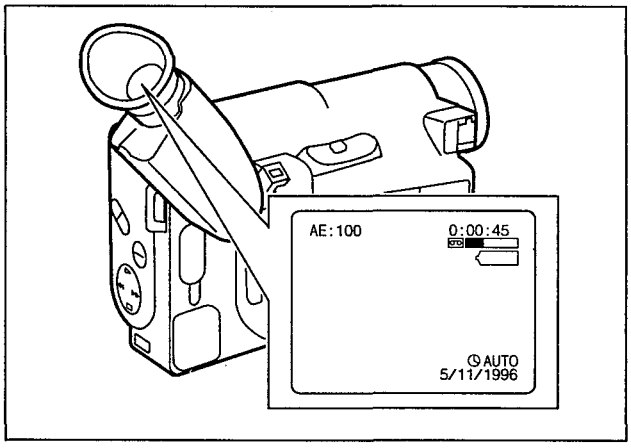
AUTOMATIC DATE RECORDING

This feature records the date automatically once a day. After you begin recording, the date is recorded automatically for 10 seconds. The same date is recorded again in the following cases.

- When the cassette is replaced
- When "◷ AUTO" is displayed again after being switched to the date display
- When the recording is for less than 10 seconds

If the date changes while recording continues over 10 seconds, the date is recorded for 10 seconds when recording is restarted after the camera/recorder has been set to the standby mode.

Press the DATE/TITLE button until "◷ AUTO" and the date appear in the viewfinder before you begin to record. The date will be recorded whenever it appears in the viewfinder.



AUTOMATIC TITLE RECORDING

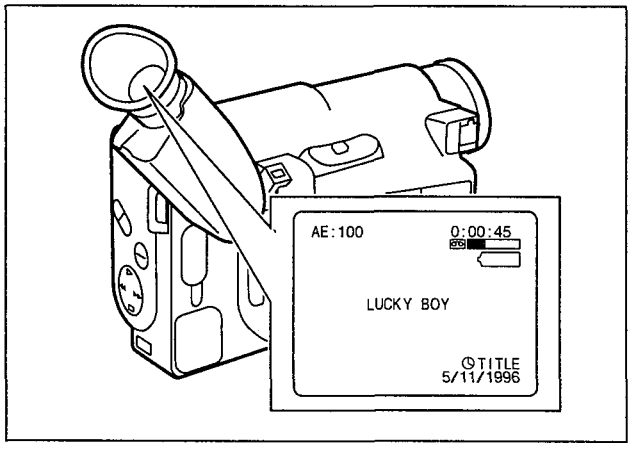
This feature records the created title on the tape together with the date automatically once a day. After you begin recording, the date and title are recorded automatically for 10 seconds. The same date and title are recorded again in the following cases.

- When the cassette is replaced
- When "◷ TITLE" is displayed again.
- When the recording is for less than 10 seconds

Press the DATE/TITLE button until "◷ TITLE" and the date and title appear in the viewfinder before you begin to record. The date and title will be recorded whenever they appears in the viewfinder.

(To create a title, see "TITLE RECORDING" on page 21.)

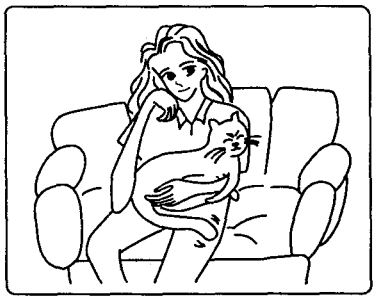
NOTE: When "◷ TITLE" is displayed in the viewfinder, the title cannot be turned on or off using the remote control. To insert the title during recoding, press the DATE/TITLE button on the camera/recorder so that "◷ TITLE" disappears.



AUTO FOCUS

- You can always focus the object automatically if "FOCUS" is not displayed in the viewfinder.

- **The object at the centre of the viewfinder is in focus.**



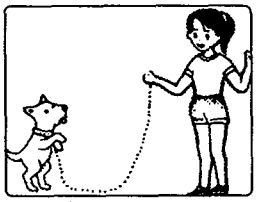
Good

No good

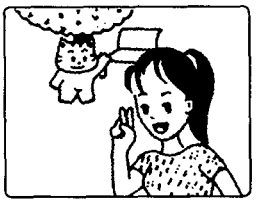
The range of object with which auto focus can be used

- On "T" side : about 1 m from the lens surface to infinity.
- On "W" side : about 1 cm from the lens surface to infinity.

■ **You cannot focus automatically with the following objects. Focus manually.**

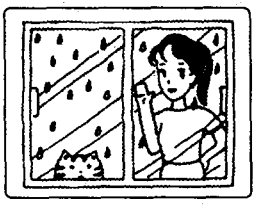


1. Objects not in the centre of the viewfinder.

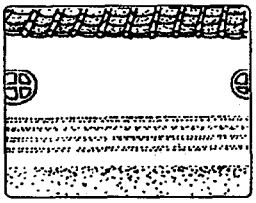


2. Objects at far and near positions at the same time.

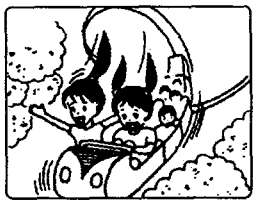
3. Objects lit by a spot-light or neon signs, etc.



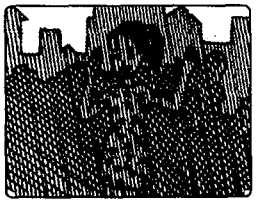
4. Objects behind glass with water droplets or dust on it.



5. Objects with almost no difference in brightness such as a white wall.



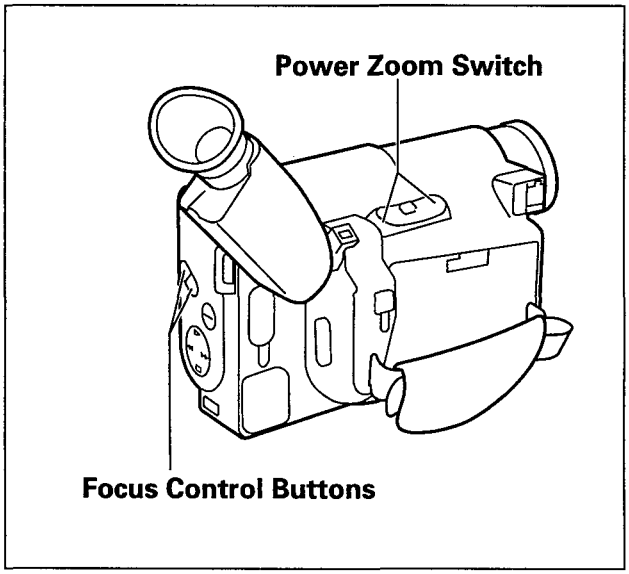
6. Objects moving rapidly.



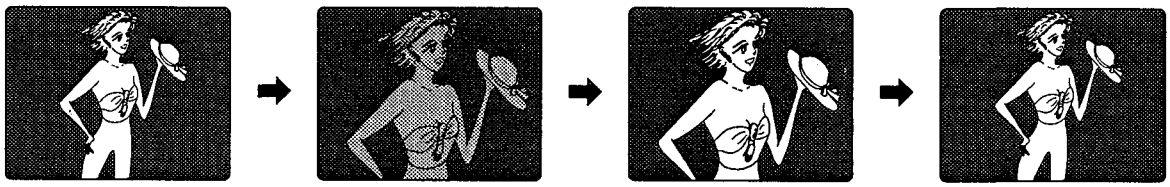
7. Dark objects

■ MANUAL FOCUSING

1. Press the FOCUS control buttons simultaneously to display "FOCUS" in the viewfinder.
   - When "FOCUS" is displayed in the viewfinder, you can adjust the focus manually.
   - When the FOCUS control buttons are pressed again, "FOCUS" disappears from the viewfinder and the camera returns to the auto focus mode.
2. Zoom in on the object by pressing the power zoom switch on the "T" side.
3. Press the FOCUS control F (far) or N (near) buttons to bring the subject into focus.
   NOTE: If focusing is performed without zooming up first, the picture may become out of focus when the zoom-up is done during actual picture taking.
4. Then, zoom back the object as desired.



NOTE: After using the manual focus, press the FOCUS control buttons simultaneously to switch off "FOCUS" in the viewfinder.

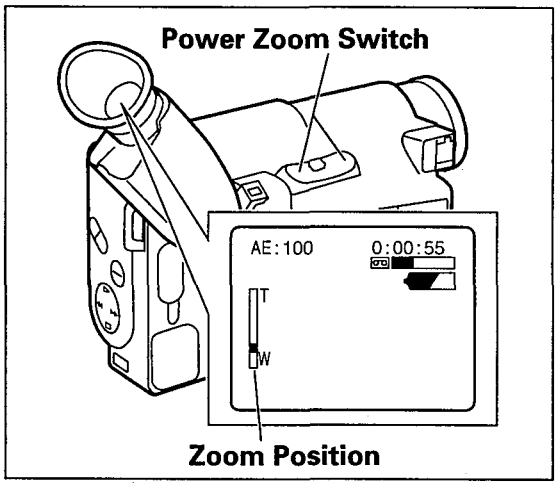


POWER ZOOM

- Press power zoom switch on the "W" side, and the picture gradually widens.

- Press power zoom switch on the "T" side, and the picture gradually becomes telescopic.

NOTE: When the power zoom switch is operated, the zoom position is displayed in the viewfinder for about 5 seconds and then disappears. The zoom position is displayed in 10 steps.

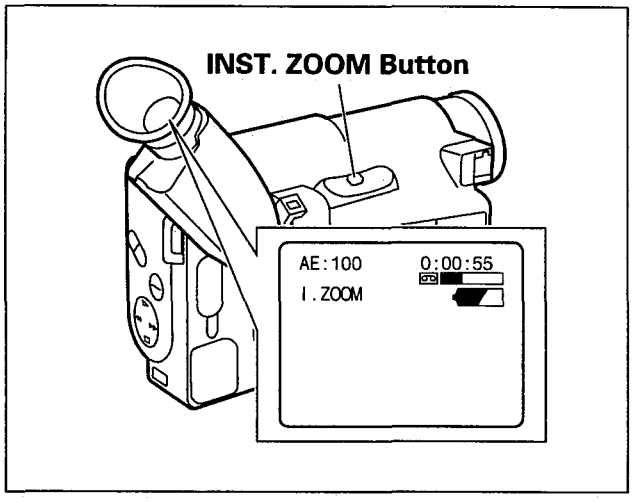


INSTANT ZOOM

The instant zoom feature activates the digital zoom to magnify the subject being recorded 1.5 times momentarily regardless of the zooming engaged by the power zoom switch.

Press the INST. ZOOM button. "I.ZOOM" appears in the viewfinder and the subject is magnified 1.5 times. The instant zoom function only operates when "I.ZOOM" is displayed. To release instant zoom, press the INST. ZOOM button again so that "I.ZOOM" disappears from the viewfinder.

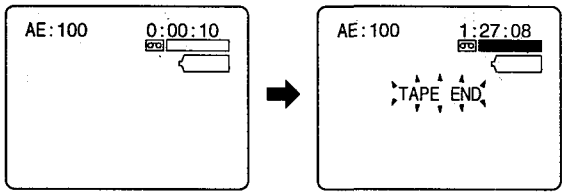
NOTE: When the instant zoom is used, the more the image is magnified, the rougher the picture becomes. Also even a slight shaking of the camera/recorder is conspicuous.



REMAINING TAPE

The tape remaining display shows the remaining tape that can be used for recording and playback in the viewfinder using bars.

Insert a cassette into the camera/recorder; " ⊡ ------ " appears in the viewfinder. 10 seconds after recording or playback is started, the remaining tape will be displayed. The display will appear when a cassette is loaded, and it will disappear when the cassette is ejected.



NOTES:

- The maximum tape remaining is displayed by the 7 bars as shown below regardless of the recording time of the cassette being used. The remaining tape per bar is different for different cassettes.
- The tape remaining display appears 10 seconds after the tape starts to run.
- The "TAPE END" indication in the viewfinder starts flashing when there is about three minutes recording time left on the cassette.

TITLE RECORDING

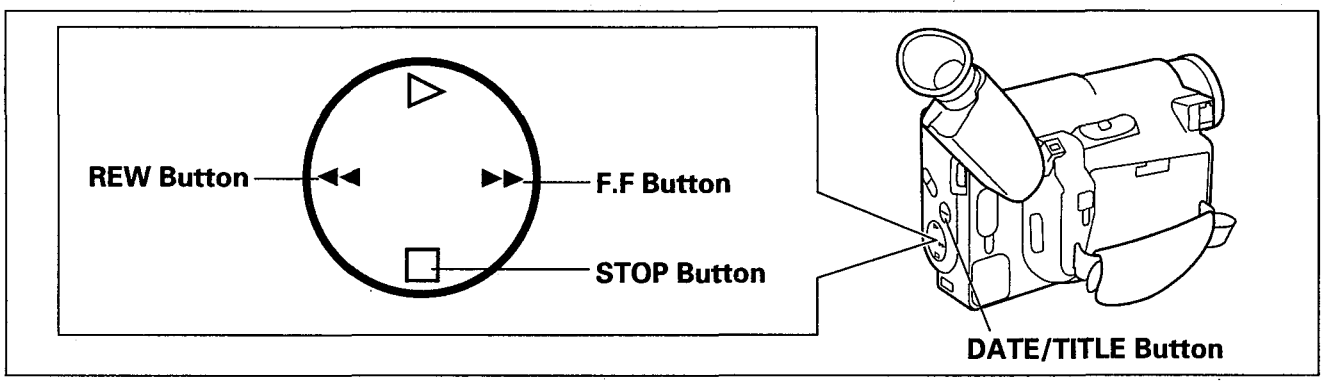
You can easily create a personalized title and record it on your videos with the camera/recorder's built-in titler.

Once a title is stored, it can be displayed and recorded at anytime. A title page can contain two lines of 16 characters each.

The titler contains 47 different characters for creating a title.

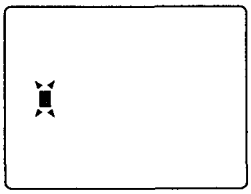
When creating and recording a title, use the TITLE ON/OFF button on the remote control. The DATE/TITLE button on the camera/recorder can also be used to create a title in the camera mode.

NOTE: Be sure to insert the clock battery before creating a title. Although a title can be created without the clock battery inserted, it will disappear when the battery providing power to the camera/recorder is removed.



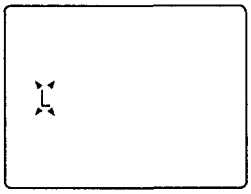
■ Creating a title

1. Press TITLE ON/OFF button on the remote control. The flashing cursor will appear in the viewfinder.

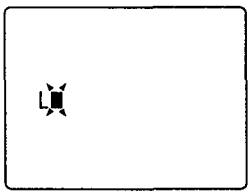


2. Press STOP button repeatedly to move the flashing cursor to the place you want to begin your title.
3. Select the first character for your title by pressing the REW or F.F button repeatedly until the desired character appears.

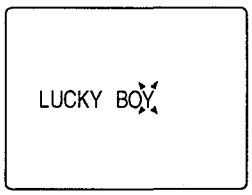
   NOTE: A title can contain up to two lines of 16 characters each. A chart showing the characters contained in the registers is located on the right.



4. After you have selected the first character, press STOP button to move the flashing cursor to the place you want the next character.



5. Repeat steps 3 and 4 until you have completed the title.



   NOTE: Character may flash, however it will be recorded correctly without flashing.
6. After creating the title, press TITLE ON/OFF button on the remote control to remove the title graphics from the viewfinder. Now title graphics are stored in memory.
   Note: As long as the correct current time can be displayed, the title is held in memory.

■ Correcting errors during programming

1. Press STOP button repeatedly until the character to be corrected flashes.
2. Press either REW or F.F button until the correct character appears.

NOTE: The corrected character may flash, however it will be recorded correctly without flashing.

■ Recording a title on a tape in the camera/ recorder

1. Slide Operate switch to "VIDEO".
2. Locate the position on the tape that you wish to record the title.
3. Slide Operate switch to "CAM".
4. Press TITLE ON/OFF button on the remote control to display the title graphics.
5. Press Start/Stop button to start the title recording.
6. Press TITLE ON/OFF button on the remote control to remove the title graphics from the viewfinder.
   The camera/recorder will now record as normal.

■ Recording a title on another VCR while playing a tape back with the camera/recorder

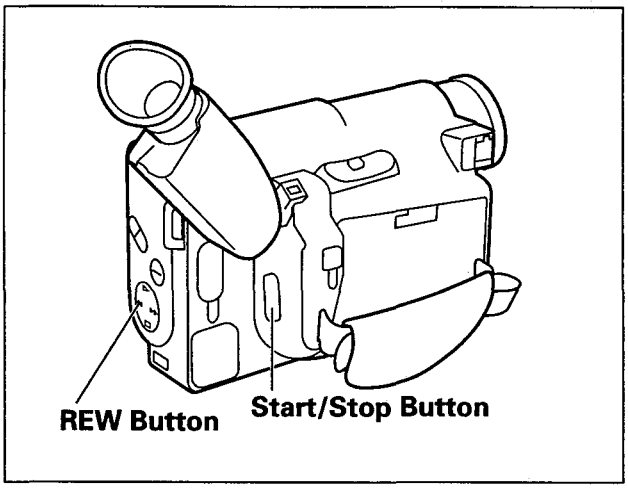
1. Connect the camera/recorder and VCR.
   (See page 31.)
2. Set the VCR in the recording mode and camera/ recorder in the playback mode.
3. Press TITLE ON/OFF button on the remote control when you see the scene where you want to record the title.
4. Press TITLE ON/OFF button on the remote control to erase the display from the viewfinder.

■ Chart of characters available

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
S	T	U	V	W	X	Y	Z	0	1	2	3	4	5	6	7	8	9
?	'	.	/	,	-	;	:	<	>	!							

INSTANT REVIEW

1. In record/pause (stand by) mode, tap REW button, and the recorded scene of the last few seconds is played back in the reverse direction and then played back in the forward direction.
2. When the tape reaches the end of the scene you have just recorded, the camera/recorder returns to the record/pause (stand by) mode. Recording starts again when the Start/Stop button is pressed again.

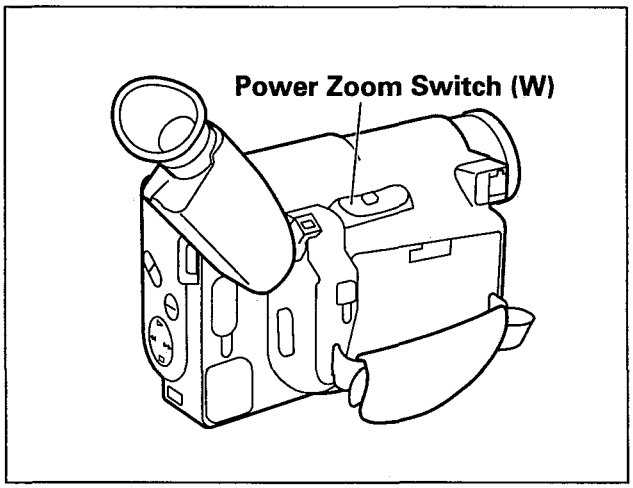


MACRO

It permits you to shoot objects as close as 1 cm from the lens tip.
Press and hold "W" side of power zoom switch. An object is auto focused.

NOTES:

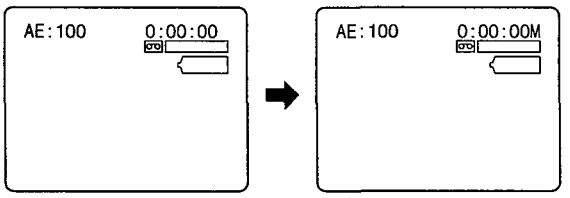
- Determine the size of the object by moving the camera backward and forward.
- Be careful as the lighting tends to be low when shooting in the above conditions.
- A subject 1m from the lens surface to infinity can be focused on the telephoto side.



DISPLAY BUTTON

When the DISPLAY button on the remote control is pressed, the displays in the viewfinder will change as follows.

- When a recorded tape is in the camera/recorder during the recorder mode, "SEARCH" appears in the viewfinder. (Refer to "DATE SEARCH" on page 25).



Linear time counter

(cannot be monitored on the TV)

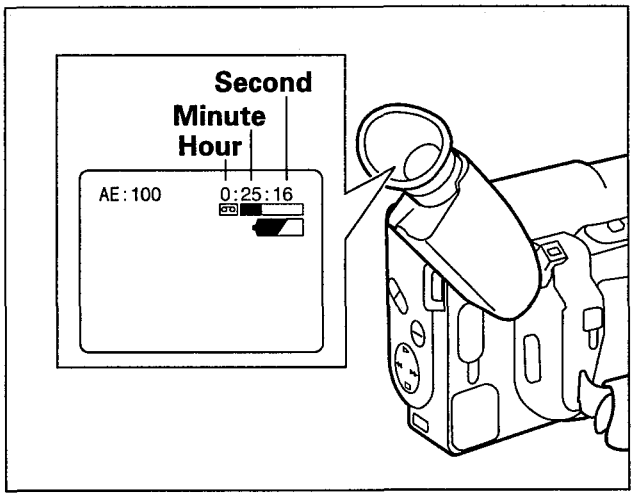
Linear time counter with memory

(can be monitored on the TV)

LINEAR TIME COUNTER

Shows length of tape run in hours, minutes and seconds.
When the camera/recorder is turned on, the linear time counter appears in the viewfinder.
Load a cassette into the camera/recorder and perform recording or playback; the counter indicates the elapsed time. Press the COUNTER RESET button on the remote control to reset the counter to "0:00:00".

NOTE: Counter changes to "0:00:00" when cassette is ejected.

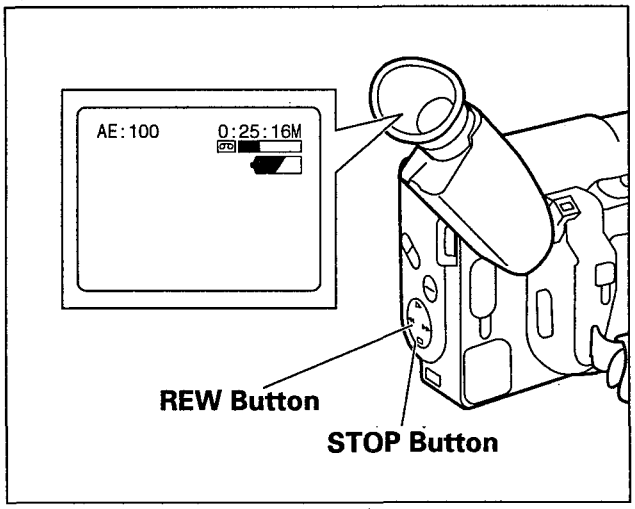


MEMORY

When the linear time counter with memory indication appears in the viewfinder, a tape that is being rewound automatically stops when the counter reads approximately "0:00:00M". This is useful if there is a section of tape you want to review immediately after recording or if you want to return to the same point several times in a row.

1. Press DISPLAY button on the remote controller until the linear time counter with memory is displayed.
2. Start playing or recording a tape.
3. At the point you want playback to start, press COUNTER RESET button on the remote control to reset the counter to "0:00:00M".
4. Continue to play or record.
5. Press STOP button to stop playback, or press Start/Stop button to stop recording and set Operate switch to "VIDEO".
6. Press REW button. The tape will be rewound to the preselected point, at approximately "0:00:00M" indication.

NOTE: The tape will also stop approximately at "0:00:00M" during fast forward mode.



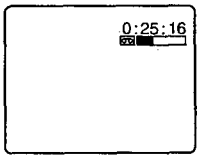
DATE SEARCH

The date search function memorizes the start and end positions of recordings you made on a specific day so you can easily locate those positions later as long as the cassette is left in the camera/recorder.

NOTE: Be sure that the date and time are set.

1. Attach a power source and slide the Operate switch to "VIDEO".
2. Press the DATE/TITLE button (the DISPLAY button on the remote control) to display "SEARCH" in the viewfinder.

3. Press the REW button to search for the start position from which you last made a recording or the F.F button (the F.FWD button on the remote control) to recording end position.
4. When the required position is located, the camera/recorder enters the stop mode and "SEARCH" disappears from the viewfinder.



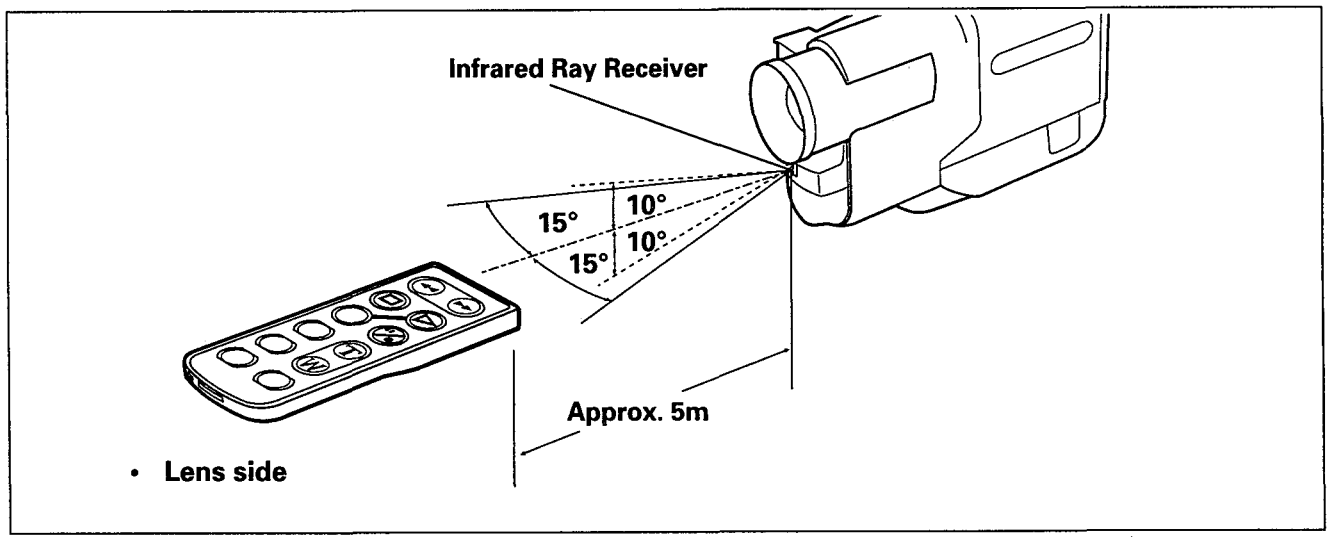
NOTES:

- If you have ejected the cassette, this function will not operate with that cassette. (When a cassette is inserted and the recording is started, the position is identified as the recording start position on that day.)
- If the clock battery is not inserted, the date search function does not operate when the battery providing the power to the camera/recorder is removed.
- When the cassette was recorded by another camera/recorder, the date search function does not operate.
- The date search function is released when you press the STOP button during date search mode.
- If the recorded time is less than 30 seconds, the date search function may not operate normally.

WIRELESS REMOTE CONTROL

You can operate the camera/recorder with the wireless remote control (provided) from a distance. The buttons on the remote control except for A/V DUB, DISPLAY, COUNTER RESET, TITLE ON/OFF and S.EDIT have the same functions as the buttons with the same identifications on the camera/recorder. Aim the remote control at the receiver of the camera/recorder.

■ **Remote controllable range**



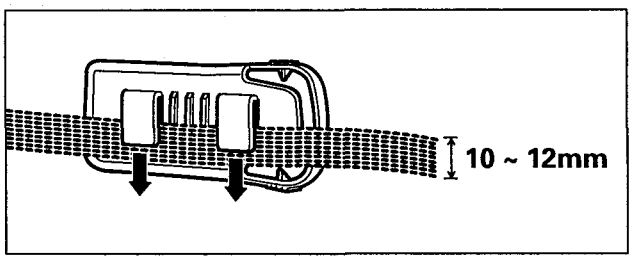
Cautions on the remote control

- Use the remote control indoors. When the infrared ray receiver is exposed to direct sunlight or strong light such as that from artificial lighting, the remote control may not operate correctly.
- The remote control cannot be operated if there is an obstacle between the remote control and infrared ray receiver.
- The remote control code of this camera/recorder is "VCR2". If the remote control code of your VCR is the same, "VCR2", your VCR may malfunction when this remote control is used.

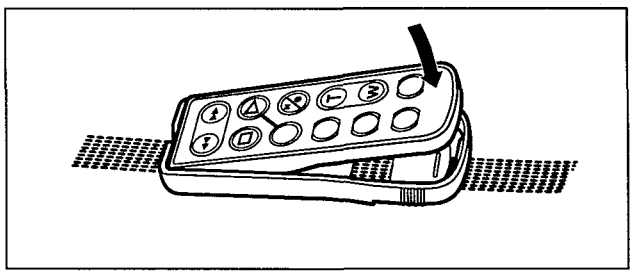
■ **How to attach the remote control to a generally available shoulder strap**

It is recommended that you fit the remote control into the holder and attach the holder to the shoulder strap so as not to lose the remote control and for convenience when shooting outdoors.

1. Attach the holder to the shoulder strap.

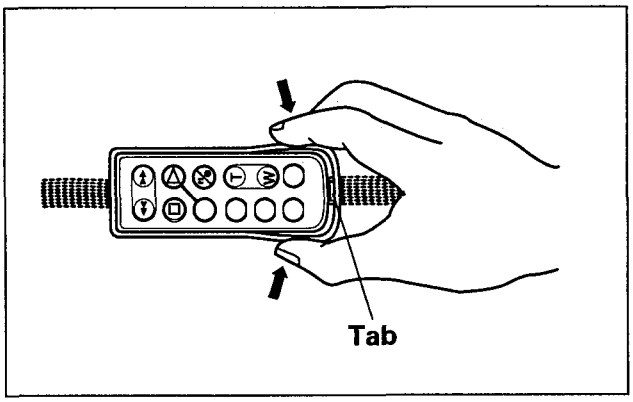


2. Attach the remote control to the holder.
   Fit the remote control into the holder as shown in the figure below and push the control in the direction of the arrow until a click is heard.



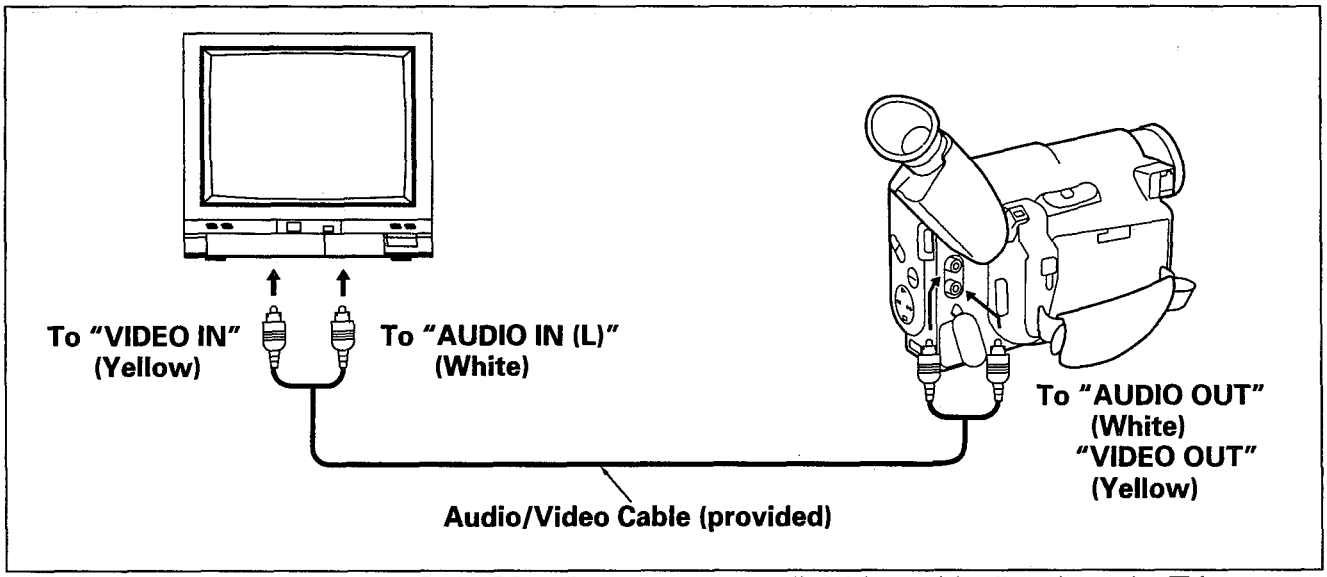
■ **To remove the remote control**

Push both sides of the holder until the remote control is released from the tab. The rear of the remote control will be released from the holder and will lift slightly.



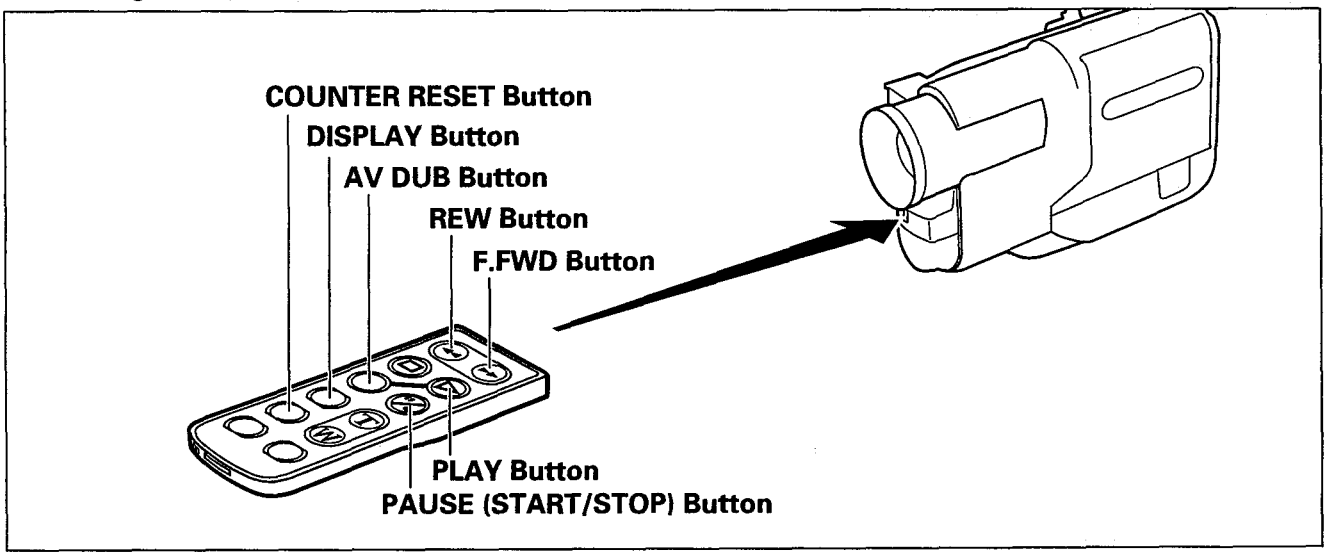
AUDIO/VIDEO DUBBING

Audio/video dubbing lets you record new audio and video from the camera/recorder's built-in microphone and camera onto the tape in the camera/recorder.



NOTES:
- If your TV has "AUDIO/VIDEO IN", connect the audio/video cable directly to the TV.
- If your TV has two (stereo) audio inputs, connect the audio plug to the left-channel audio input.
- When the audio/video dubbed portion is played back, noise may appear at the end of the dubbed portion.
- If the camera/recorder is in AV DUB pause or STILL mode for more than 5 minutes, the camera/recorder stops automatically to protect the tape.
- Automatic date recording is disabled during audio/video dubbing.

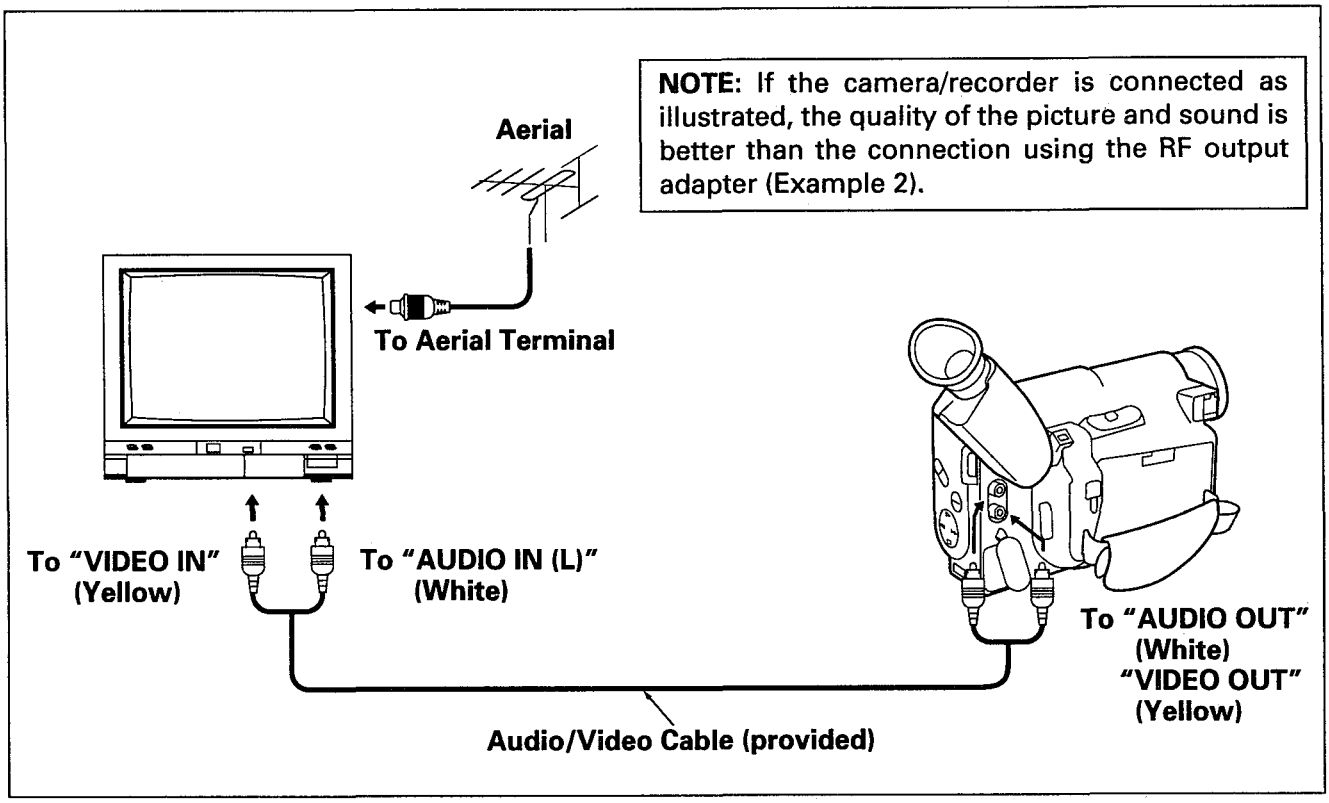
1. Insert a recorded tape.
   Be sure that the record-protect tab is not closed.
2. Slide Operate switch to "VIDEO".
3. Aim the remote control at the receiver on the camera/recorder.
4. Press PLAY button and then REW or F.FWD button to search to the approximate area on the tape where you want to begin your dub.
5. Press PLAY button again to search for the exact position that you want to stop dubbing and then press PAUSE (START/STOP) button.
6. Press DISPLAY button so that the linear time counter with memory appears and then press COUNTER RESET button to set the counter reading to "0:00:00M".
7. Press REW button to rewind the tape to the approximate position that you want to start dubbing.
8. Press PLAY button, and when the exact position that you start to dub is reached, press PAUSE (START/STOP) button.
9. Press and hold the A/V DUB button, and then press the PLAY button."A/V DUB ❚❚" appears in the viewfinder, and at the same time the picture to be dubbed appears.
10. Press PAUSE (START/STOP) button.
    "A/V DUB" will appear in the viewfinder and A/V dubbing will start. A/V dubbing will stop when the counter reads "0:00:00M".



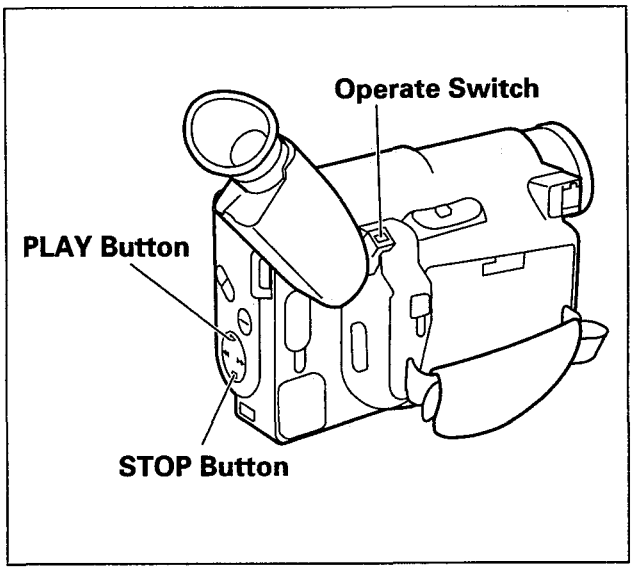
CONNECTIONS AND OPERATIONS FOR VIEWING THE PICTURE PLAYED BACK ON YOUR TV

To play back a tape recorded on your camera/recorder and view it on your TV receiver, you must connect the camera/recorder to the TV receiver using either audio/video cable or RF output adapter.

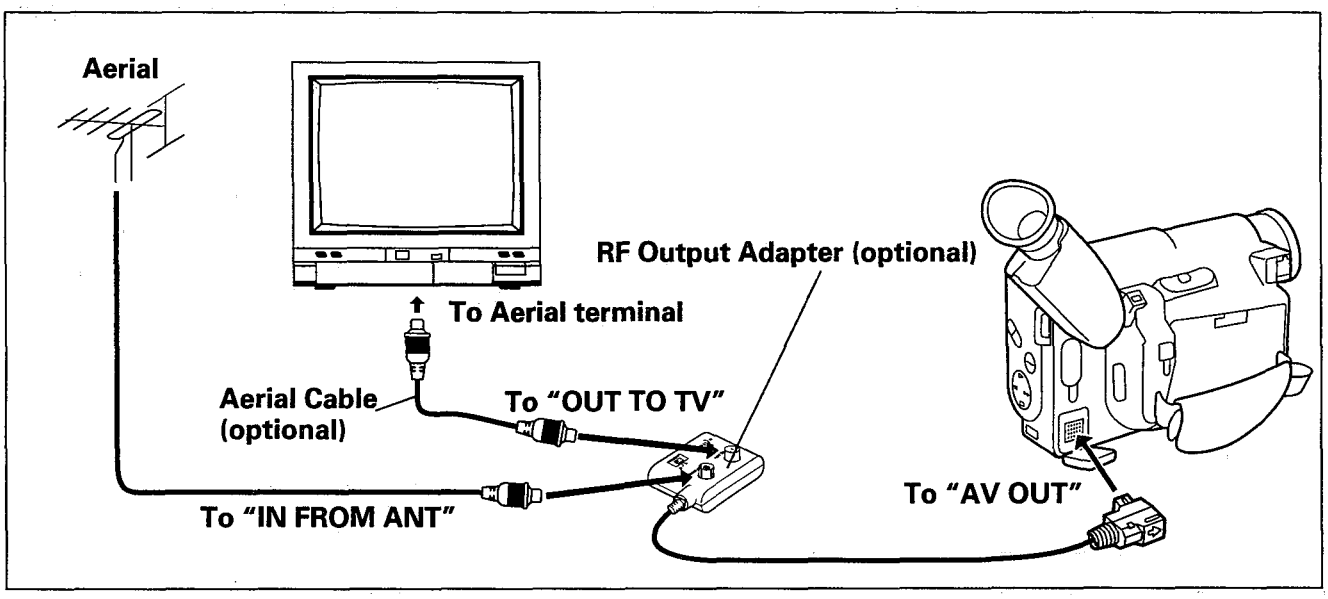
Example 1: If your TV has AUDIO/VIDEO IN jacks,


NOTE: If the camera/recorder is connected as illustrated, the quality of the picture and sound is better than the connection using the RF output adapter (Example 2).
Aerial
To Aerial Terminal
To "VIDEO IN" (Yellow)
To "AUDIO IN (L)" (White)
To "AUDIO OUT" (White)
"VIDEO OUT" (Yellow)
Audio/Video Cable (provided)

1. Connect the TV and camera/recorder as illustrated above.
   NOTE: If your TV has two (stereo) audio inputs, connect the audio plug to the left-channel audio input.
2. Turn on TV and select video input.
3. Insert the cassette.
4. Slide Operate switch to "VIDEO".
5. Press PLAY button.
6. After playing press STOP button.



Example 2: If your TV is a regular TV,



1. Remove the antenna cable from your TV set. Connect this cable to "IN FROM ANT" on the RF output adapter.
2. Connect the Aerial cable to "OUT TO TV" on the RF output adapter.
3. Connect the other end to aerial terminal on your TV.
4. Connect the connector cable from RF output adapter to "AV OUT" on the camera/recorder.
5. Turn on the TV and select an unused channel (CH37). Refer to "VIDEO CHANNEL SETTING" below.
6. Perform same procedures in steps 3 through 6 of "Example 1" on page 28.

NOTE: With this connection, the output sound is monaural.

NOTE: If you want to watch a TV programme with camera/recorder connected as illustrated, slide Operate switch of the camera/recorder to "OFF".

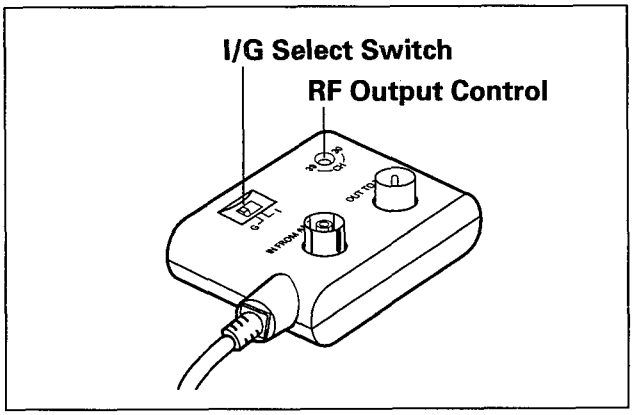
VIDEO CHANNEL SETTING

When viewing the picture played back by the camera/recorder on your TV, change over the I/G select switch of the RF output adapter matching your TV as well as to select the video channel on the TV.

1. Connect TV, RF output adapter and camera/recorder. (See above)
2. Set I/G select switch on RF output adapter as follows.

Colour TV broadcast system in your country	Position of I/G Select Switch
PAL (System I)	I
PAL (System B & G)	G

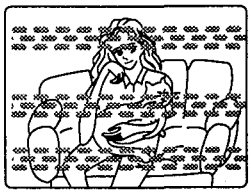
3. Turn on TV and select an unused channel (CH37). (In some cases this may be marked A/V.)
4. Insert the recorded tape to camera/recorder.
5. Slide Operate switch to "VIDEO".
6. Press PLAY button of camera/recorder. Now playback picture appears on your TV. If the playback picture is not clear or channel 37 is used for broadcasting in your area, adjust the RF output control of RF output adapter using a small screwdriver and readjust your TV until the playback picture is clearly observed.

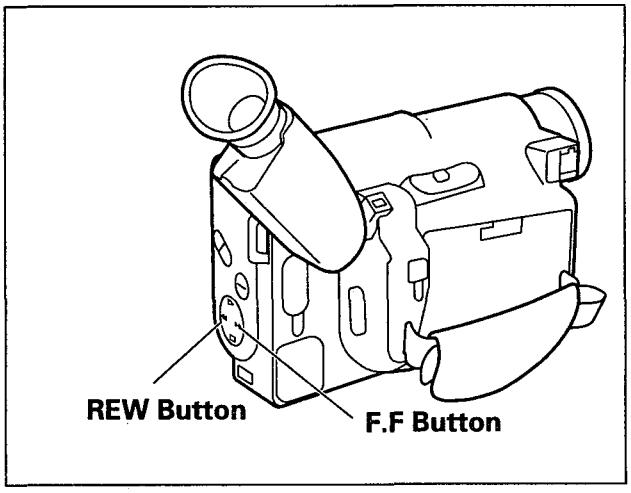


F-SEARCH AND R-SEARCH

When you press F.F or REW button during playback, the tape will be played back at a speed about 7 times (forward search) or 5 times (reverse search) faster than the normal playback speed, and you can easily locate a certain spot on the tape.

NOTE: There will be noise (interference) in the F-search or R-search pictures.



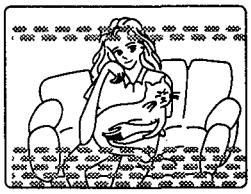


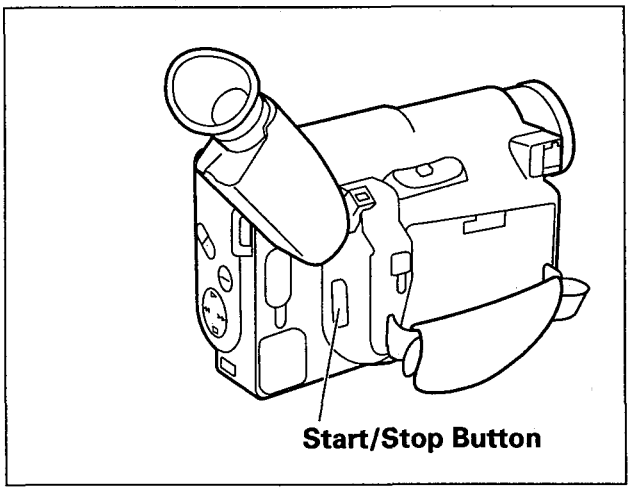
STILL

When Start/Stop button is pressed during playback, a still picture can be seen. To start again press Start/Stop button and playback will be resumed.

NOTES:

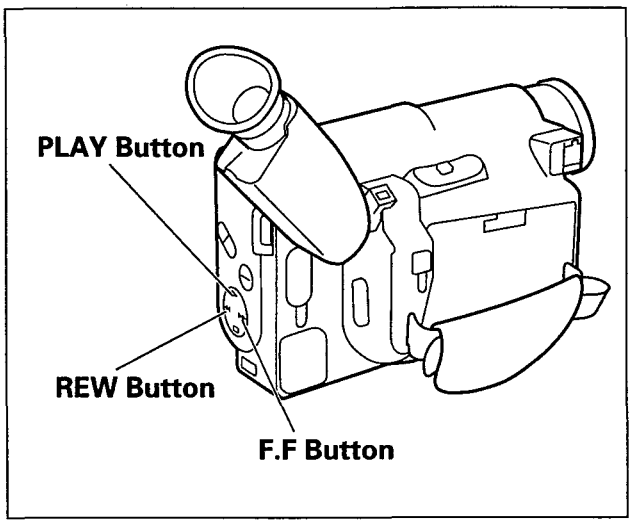
- There will be noise (interference) in the still picture.
- If the play pause mode continues for more than 5 minutes, the camera/recorder will automatically enter the stop mode to protect the tape from damage.



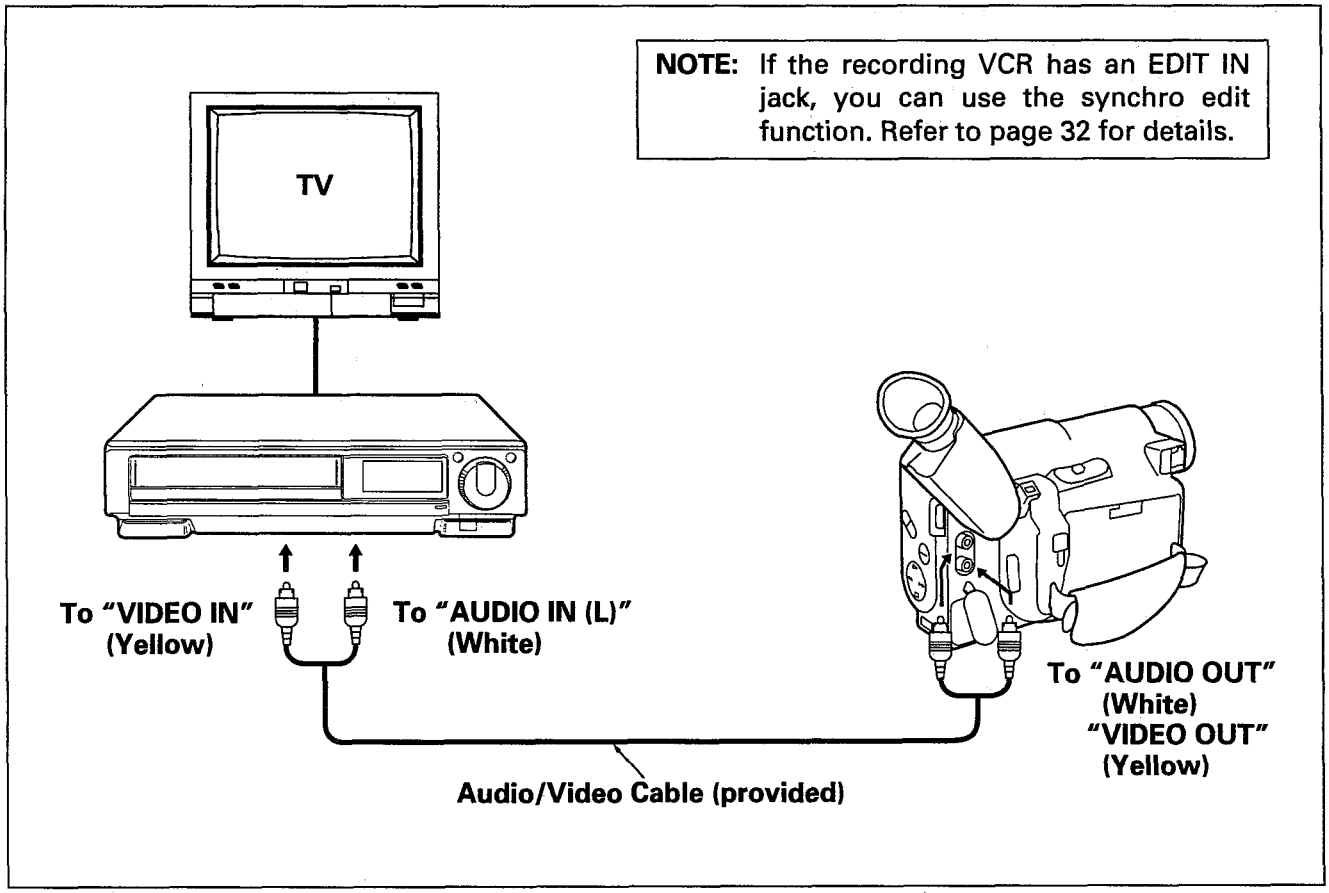


QUICK EDIT

The quick edit feature allows you to search for the end of previously recorded material, or find a particular spot on your tape, to begin your editing, or recording new material. Quick edit is used while the camera/recorder is in the record/pause (stand-by) mode. By holding down the F.F, REW, or PLAY button you can visually search or play your tape. Releasing the buttons (F.F, REW, or PLAY) immediately stops the tape at that position.



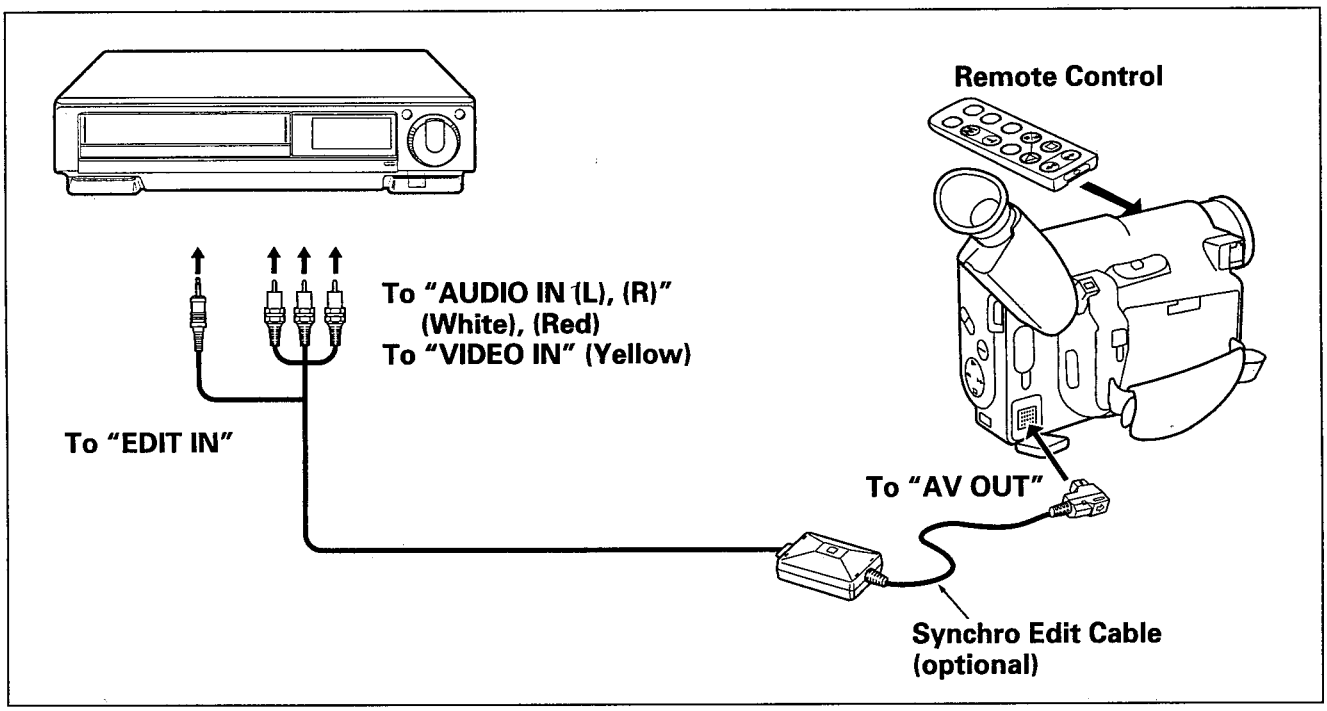
CAMERA/RECORDER TO VCR DUBBING


NOTE: If the recording VCR has an EDIT IN jack, you can use the synchro edit function. Refer to page 32 for details.
TV
To "VIDEO IN" (Yellow)
To "AUDIO IN (L)" (White)
To "AUDIO OUT" (White)
"VIDEO OUT" (Yellow)
Audio/Video Cable (provided)

1. Connect the camera/recorder, VCR and TV as shown in the figure, and then turn on their operate switches.
   NOTES:
   - Select line input with your VCR. Refer to the instruction manual of your VCR for details.
   - If your VCR has two (stereo) audio inputs, connect the audio plug to the left-channel audio input.
2. Insert the cassette used for editing into the camera/recorder and the cassette to be recorded into the VCR.
3. Play the tape on camera/recorder and record it on the VCR.

SYNCHRO EDIT

Synchro edit allows your camera/recorder to control a compatible VCR (one that has an EDIT IN jack) while tapes are being copied from the camera/recorder to the VCR. This is convenient when you want to record only selected segments from a previously recorded tape.



1. Connect your camera/recorder to a compatible VCR as shown above. An optional synchro edit cable is required.
   NOTES:
   - Select line input with your VCR. Refer to the instruction manual of your VCR for details.
   - If your VCR has a single (mono) audio input, connect either the left or right audio plug to the audio input on the VCR.
2. Insert the recorded tape into the camera/recorder.
3. Insert the blank tape into the recording VCR.
4. Point the remote control at the receiver on the camera/recorder and use the remote control to operate the camera/recorder.
5. Press PLAY and then REW or F.FWD button to search to the approximate position of the tape on which you want to dub a picture.
6. Press PLAY button again to search the exact position where you stop dubbing and then press PAUSE button.
7. Press DISPLAY button so that the linear time counter with memory appears and then press COUNTER RESET button to set the counter reading to "0:00:00M".
8. Press REW button to rewind the tape to the approximate position from which you want to start dubbing.
9. Press PLAY button, and when the exact position from which you start to dub is reached, press PAUSE button.
10. Press RECORD button on the VCR. The VCR automatically enters record/pause mode.
    NOTE: If the VCR begins to record instead of pausing, you will need to change the position of the switch on the synchro edit cable. Stop the VCR, change the switch, and then press RECORD button on the VCR again.
11. Pressing S.EDIT button puts the camera/recorder in the review mode for several seconds and then into the playback mode.
    The recording VCR starts recording and stops automatically when the counter reading of the camera/recorder reads "0:00:00M".

NOTES:

- Pressing REW, F.FWD, STOP or PAUSE button automatically puts the VCR into the record/pause mode. This allows you to search (forward or backward), fast-forward or rewind the tape in the camera/recorder without disturbing the tape in the VCR.
- To search forward (or backward), press F.FWD (or REW) button. When you press PLAY button, the camera/recorder will resume normal playback. To begin copying again, press PAUSE button and then the S.EDIT button.
- To fast-forward (or rewind) the tape, press STOP then F.FWD (or REW). To begin copying again, press STOP, then PLAY, then PAUSE to pause the camera/recorder, and S.EDIT to begin copying.
- If the tape counter reads "0:00:00M" you cannot start recording.

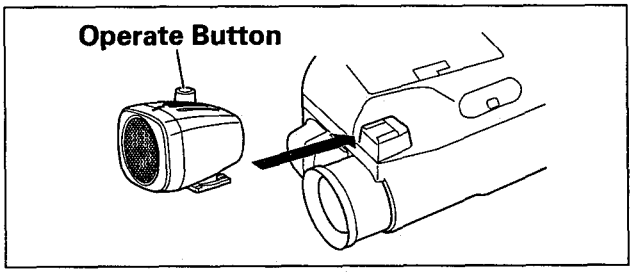
ATTACHING THE OPTIONAL DC CAMERA LIGHT

Use the DC camera light if you wish to shoot objects in dark places.

NOTES:

- When the DC camera light is used, the operation time of the camera/recorder becomes short even if a fully-charged battery pack is attached.
- When the camera/recorder is turned on, a voltage is always generated at the installation terminal of the DC camera light. Never touch this terminal.

1. Make sure that a fully charged battery pack or AC adapter/charger is attached.
2. Check that the camera/recorder is turned off.
3. Attach the DC camera light to the camera light shoe.

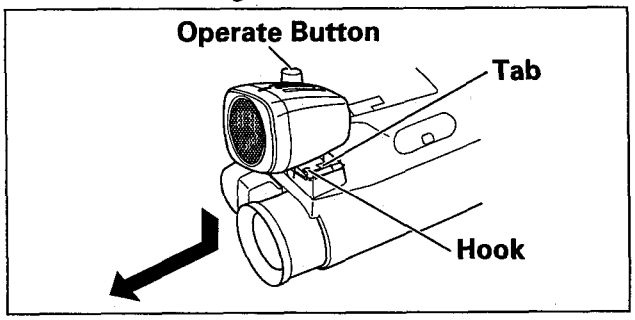


4. Turn on power of the camera/recorder and then press operate button of the DC camera light when required.

   NOTES:

   - Turn on the camera light only when you need it. Otherwise the operation time of the battery pack becomes shorter because the power consumption of the camera light is high.
   - If the DC camera light is turned on and off during recording, there could be noise in the picture. Watch the battery charge indicator especially when using a battery as the power source.

5. To remove the camera light, depress the light to release the tab from the hook and then move the light in the direction of the arrow as shown in the figure.

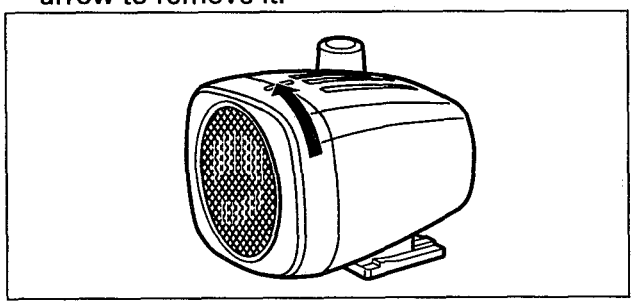


NOTES:

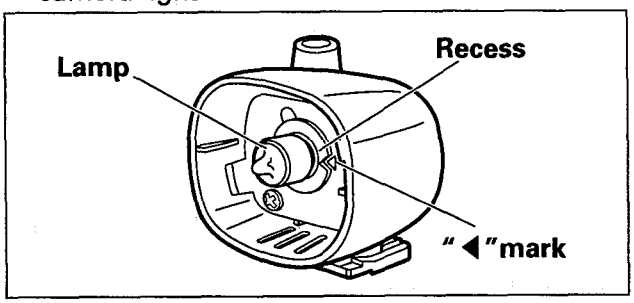
- The front and lamp of the DC camera light become very hot during use of the camera light or immediately after use. Be careful that your hand or hair does not touch them.
- Never touch the terminal of the DC camera light with your hand or short it using metal.
- When the camera light is on, do not allow water to drop on the light.
- When the camera light is on, avoid subjecting the camera light to impacts or sharp vibrations.
- Do not allow the cooling vents to become blocked. Also, do not cover the camera light with paper or other objects, since the air flow will be interrupted, resulting in possible overheating hazard.
- Never use the camera light in the vicinity of explosive or highly inflammable materials.
- When storing the camera light in the camera case following use, be sure to allow it sufficient time to fully cool down before placing it in the case.
- Replace only with the specified lamp (optional accessory), to reduce the risk of fire.

To replace the lamp of the camera light

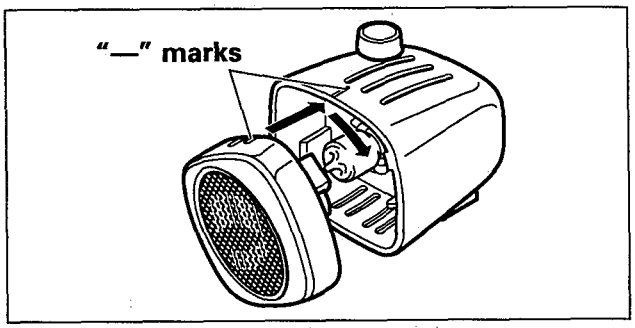
■ Turn the front case in the direction of the arrow to remove it.



■ To install the lamp in the camera light, align the recess of the lamp and the "◀" mark of the camera light.



■ Press the lamp through the hole of the reflective plate and re-attach the front case to the camera light by aligning the "—" marks of the front case and camera light, then turn the case in the direction of the arrow.



NOTES:

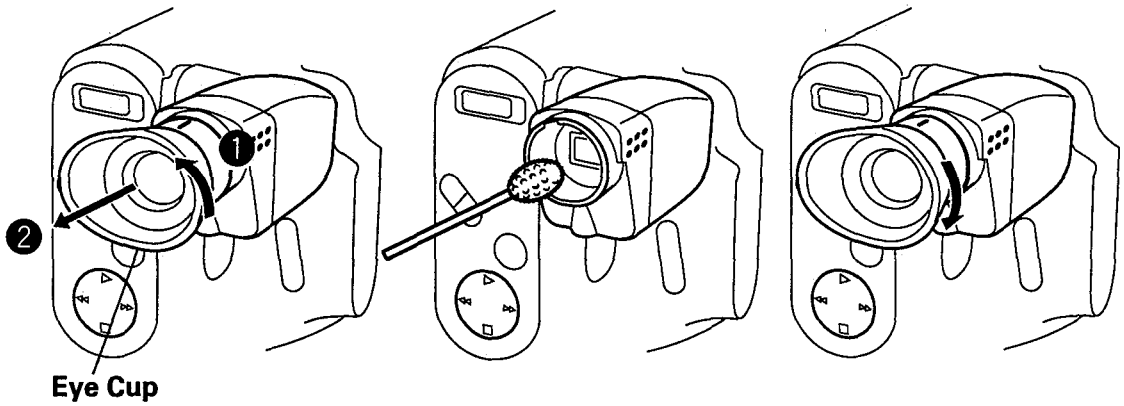
- The camera light becomes very hot when used, so please allow sufficient time for it to cool before attempting to replace or hadle the lamp.
- Do not touch the lamp directly with your fingers. It may shorten its service life.
- When the lamp is replaced, or when the front case of the camera light is removed, make sure the front case is attached to the camera light properly.

TROUBLESHOOTING

Symptom	Check Point & Correction
Cassette holder cannot be opened when you slide EJECT switch.	Connect the power source.
Cassette cannot be inserted into cassette compartment.	Load cassette in direction indicated by arrow on cassette.
	The cassette window must be towards the outside.
Picture does not appear in the viewfinder.	Remove the lens cap.
	Slide Operate switch to "CAM" position.
The camera/recorder cannot go into the recording mode, even when Start/Stop button is pressed.	Check the record-protect tab on the cassette. See page 15 for details.
	Set Operate switch to "CAM" position.
	Push the cassette holder embossed PUSH LOCK to close it.
	The " ▬ " indication in the viewfinder flashes to indicate battery is discharged. Try another battery or charge the battery.
PLAY button cannot be engaged.	Set Operate switch to "VIDEO" position.
Interference on playback picture. (The TV is connected to the camera/recorder using the RF output adapter.)	When you see the playback picture on your TV, adjust fine tuning knob on television set to obtain the best picture.
Picture is out of focus. Auto-focus does not operate correctly.	Press FOCUS control buttons simultaneously to erase "FOCUS" in the viewfinder.
	Auto-Focus does not operate correctly if a special-effects filter is attached or with the objects shown on page 19.
Power is interrupted.	If the record pause mode continues for more than 5 minutes, power is shut off automatically. Press the Start/Stop button to restore the power.
Power is turned on, but no button operations are accepted.	Remove the power source and the clock battery. And after about one minute, the display in the viewfinder will be reset. Then set the information again.
The camera/recorder does not operate when alkaline batteries are inserted.	Check that the polarities (+,–) of the batteries are correct.
	Insert six batteries.
"TAPE" appears in the viewfinder.	Have you moved the camera/recorder or cassette from a cold place to a warm place so that its temperature changed abruptly? If the temperature has changed, remove the cassette and set the Operate switch to OFF, then wait for about one hour.
	Remove the cassette and then try to reinsert: remove it several times. If the indication is still shown in the viewfinder, use a cleaning tape to clean the heads and replace the cassette.

■ CLEANING THE INSIDE OF THE ELECTRONIC VIEWFINDER

If dust or foreign matter adheres inside the viewfinder, clean it by using the following procedure.



Eye Cup

1. Rotate and remove eye cup.
2. Clean the picture tube face and lens.
   To prevent scratching, use a soft non abrasive cloth, swab or lens cleaning paper.
3. Fit the projection of the eye cup into the groove in the viewfinder and rotate the eye cup in the direction of the arrow.

MAINTENANCE

1. To maintain the optimum performance of this camera/recorder, regular periodic maintenance is required. Your dealer will advise you further.
2. Maintenance and adjustments may not be carried out by the user. In all cases of difficulty or doubt, consult your dealer.
3. Head cleaning
   Dirt accumulated on the video heads after a period of time may cause the playback picture to become blurred or part of the video information to be lost. This does not mean that the recorded programme has been erased but head cleaning is required.
   Use a dry type head cleaning tape to clean the video heads.
   When it is difficult to remove a dirt using the head cleaning tape, head cleaning requiring highly technical care is necessary.
   Consult your nearest dealer or VCR service centre for head cleaning.

SPECIFICATIONS

■ **General**

Power requirements	6V DC
Power consumption	4.8 watts (when recording)
Operating temperature	0°C to 40°C
Operating humidity	< 80%
Storage temperature	– 20°C to 60°C
Dimensions	94(W) x 120(H) x 211(D) mm
Weight	Approx. 865g (without battery pack, lens hood, lens cap and cassette)

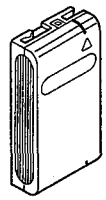
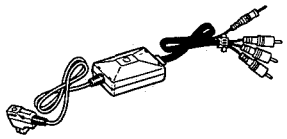
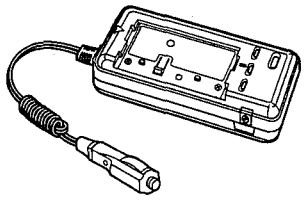
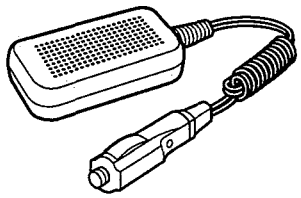
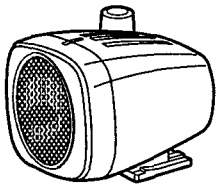
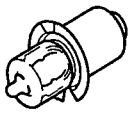
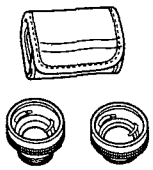
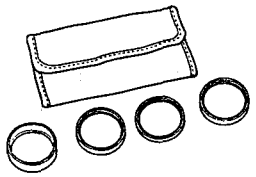
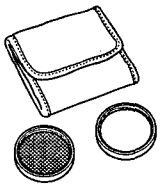
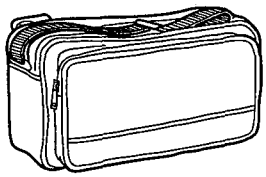
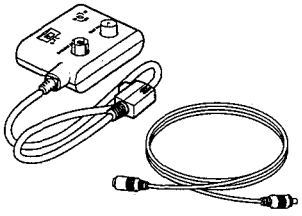
■ **Video Recorder Section**

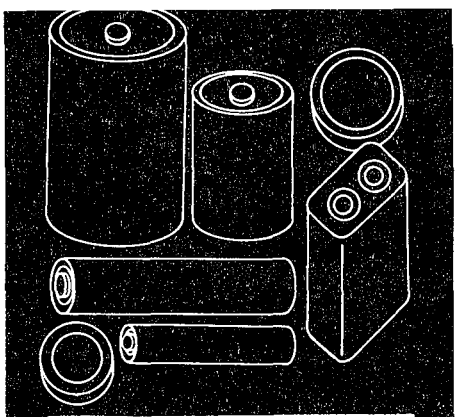
Format	8mm
Record/playback system	Two video record/playback heads
Video signal	PAL colour & CCIR monochrome signals 625 lines
Tape speed	SP: 20.05 mm/sec.
Video output	1.0 Vp-p, 75 ohm
Audio output	– 8 dBs, less than 1K ohm
Fast forward/rewind time	Less than 8 minutes with P5-90 cassette

■ **Camera Section**

Scanning	625 lines/50 fields/25 frames
Required minimum illumination	2 lux
Camera device	1/4" C.C.D
Lens diameter	46 mm

OPTIONAL ACCESSORIES

Battery Pack (for standard play) VM-BP84	Synchro Edit Cable VM-CH95	Car Adapter Charger VM-CA80E	Car Battery Cord VM-CC80E
			
DC Camera Light VM-CP4	**Lamp for Camera Light VM-CP4L**	**Conversion Lens Set VM-CL12TW**	**Filter Kit VM-FL60K**
			
Filter Kit VM-FL46K	**Soft Case VM-CB55SR**	**RF Output Adapter VM-RF85E**	
			

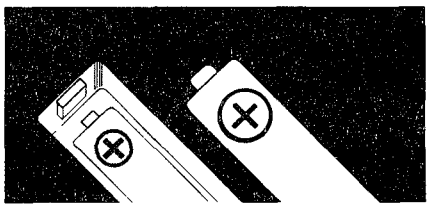


BATTERY SAFETY GUIDELINES

Used correctly, domestic batteries are a safe and dependable source of portable power. Problems can occur if they are misused or abused– resulting in leakage or, in extreme cases, fire or explosion.

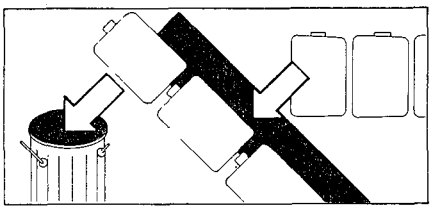
Here are some simple guidelines to safe battery use designed to eliminate any such problems.

ALWAYS



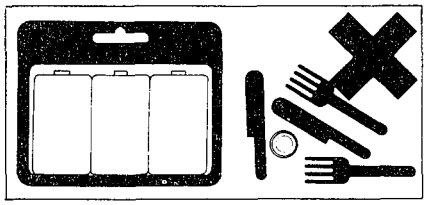
Take care to fit your batteries correctly, observing the *plus* and *minus* marks on the battery and appliance. Incorrect fitting can cause leakage or, in extreme cases, fire or even an explosion

ALWAYS



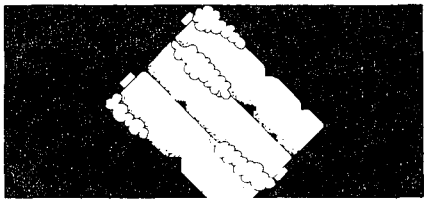
Replace the whole set of batteries at one time, taking care not to mix old and new batteries or batteries of different types, since this can result in leakage or, in extreme cases, fire or even an explosion.

ALWAYS



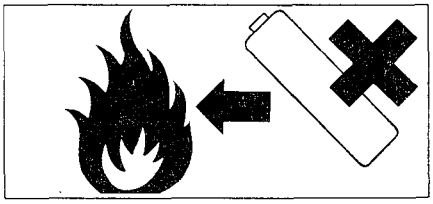
Store unused batteries in their packaging and away from metal objects which may cause a short-circuit resulting in leakage or, in extreme cases, fire or even an explosion

ALWAYS



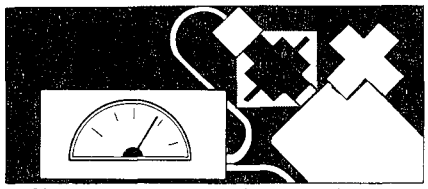
Remove dead batteries from equipment and all batteries from equipment you know you are not going to use for a long time Otherwise the batteries may leak and cause damage

NEVER



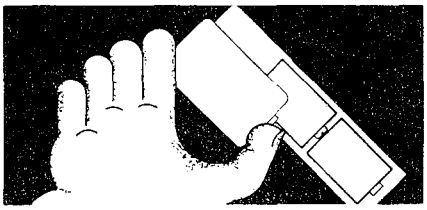
Never dispose of batteries in fire as this can cause them to explode Please put dead batteries in with the normal household waste

NEVER



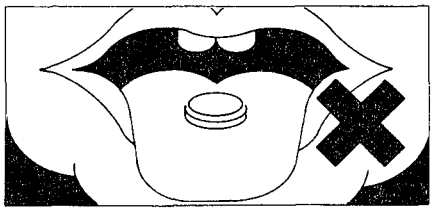
Never attempt to recharge ordinary batteries, either in a charger or by applying heat to them. They may leak, cause fire or even explode. There are special rechargeable batteries which are clearly marked as such.

ALWAYS



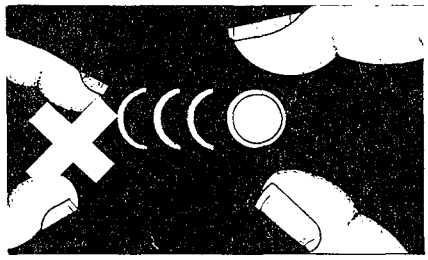
Supervise children if they are replacing batteries themselves in order to ensure these guidelines are followed

ALWAYS



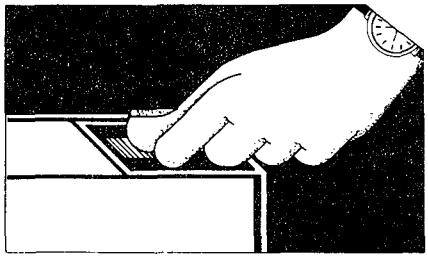
Remember that small button cell batteries such as used in some hearing aids, toys, games and other appliances, are easily swallowed by young children and this can be dangerous.

ALWAYS



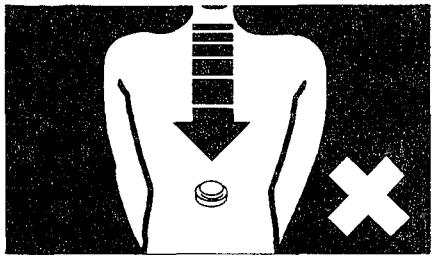
Keep loose button cells away from young children

ALWAYS



Make sure battery compartments are secure

ALWAYS



Seek medical advice if you believe a cell has been swallowed.

PUBLISHED BY THE BRITISH BATTERY MANUFACTURERS ASSOCIATION 7 BUCKINGHAM GATE, LONDON SW1E 6JS

SOME DO'S AND DON'TS ON THE SAFE USE OF EQUIPMENT

This equipment has been designed and manufactured to meet international safety standards but, like any electrical equipment, care must be taken if you are to obtain the best results and safety is to be assured.

★★★★★★★★★

DO read the operating instructions before you attempt to use the equipment.

DO ensure that all electrical connections (including the mains plug, extension leads and interconnections between pieces of equipment) are properly made and in accordance with the manufacturer's instructions. Switch off and withdraw the mains plug when making or changing connections.

DO consult your dealer if you are ever in doubt about the installation, operation or safety of your equipment.

DO be careful with glass panels or doors on equipment.

★★★★★★★★★

DON'T continue to operate the equipment if you are in any doubt about it working normally, or if it is damaged in any way — switch off, withdraw the mains plug and consult your dealer.

DON'T remove any fixed cover as this may expose dangerous voltages.

DON'T leave equipment switched on when it is unattended unless it is specifically stated that it is designed for unattended operation or has a standby mode. Switch off using the switch on the equipment and make sure that your family know how to do this. Special arrangements may need to be made for infirm or handicapped people.

DON'T use equipment such as personal stereos or radios so that you are distracted from the requirements of traffic safety. It is illegal to watch television whilst driving.

DON'T listen to headphones at high volume, as such use can permanently damage your hearing.

DON'T obstruct the ventillation of the equipment, for example with curtains or soft furnishings. Overheating will cause damage and shorten the life of the equipment.

DON'T use makeshift stands and ***NEVER*** fix legs with wood screws — to ensure complete safety always fit the manufacturer's approved stand or legs with the fixings provided according to the instructions.

DON'T allow electrical equipment to be exposed to rain or moisture.

ABOVE ALL

- ***NEVER*** **let anyone especially children push anything into holes, slots or any other opening in the case — this could result in a fatal electrical shock;**
- ***NEVER*** **guess or take chances with electrical equipment of any kind**
- **it is better to be safe than sorry!**

★★★★★★★★★

Hitachi Home Electronics (Europe) LIMITED

Hitachi House, Station Road, Hayes,
Middlesex UB3 4DR U.K.
Tel: 0181 849 2000

Hitachi, Ltd. Tokyo Japan

THE HITACHI ATAGO BLDG.
No. 15-12, 2-chome, Nishi-Shinbashi,
Minato-ku, Tokyo 105, Japan
Tel.: Tokyo (03) 3502-2111

QR12703 © Hitachi, Ltd. 1995